Foreword

The challenges of homeland security demand the timely application of scientific insight and technological solutions that must robustly keep pace with a changing threat and hazard environment. Our ability to harness the most advanced technical and scientific understanding through disciplined research and problem solving is critical to the success of our collective capability to prevent, protect, mitigate, respond to, and recover from the worst events we can imagine. Well over a decade ago, during the early phase of the formation of the U.S. Department of Homeland Security, key investments were made in developing consortia of universities and other research institutions to focus on the grand challenges envisaged in securing our nation.

With this book, Dr. Cecelia Wright Brown and her colleagues take us on a journey through the research and applications that have shaped and impacted the constellation of DHS Centers of Excellence. The book’s contributors make an effort to link research to practical applications that reminds us of the important investments that have been made in research and education. The book tracks those results through operational implementation while characterizing their influence on concepts of operation, the overall body of knowledge, and on strategic redirection of future research objectives, operational requirements, and acquisition decisions.

Dr. Wright Brown brings decades of experience as an engineer, physicist, and educator. Together with her colleagues, Drs. Kevin Peters and Kofi Nyarko, as well as the other contributors, the authors capture the importance of the Science and Technology (S&T) Center of Excellence (COE) enterprise on the readiness of our nation to meet evolving threats, and how vital this S&T investment is to enabling knowledge discovery. The book will serve to energize interdisciplinary problem solving, evidence-based research, and stimulate cost-effective practical applications for our security and safety. The authors offer the first independent, comprehensive look at the body of work accomplished by the COEs and organize this in a manner meaningful to practitioners, public safety leadership, basic and applied researchers, and private sector industrial partners who design, develop, test, evaluate, and support systems and technologies. A wide spectrum of professionals from security
managers to laboratory technicians, from computer scientists to mathematicians and engineers will benefit from this treatment of the COE enterprise.

Dr. Wright Brown uniquely understands the research and applications nexus at which government, academia, and industry must partner to optimize outcomes. Beyond her long commitment to higher education, she has been a remarkable force for collaboration among private and public entities, and she serves in key roles to develop training and education opportunities beyond the university setting, as demonstrated in her service on the American Board for Certification in Infrastructure Protection (ABCIP), which is finalizing a new certification program from practitioners in infrastructure protection and resilience. She is committed to developing the competent workforce of tomorrow that is capable of leading our homeland security programs for decades to come. It is with this dedication to education and training, to knowledge discovery and transfer, that the authors have created a timely resource to help us understand, enhance, and sustain the most beneficial outcomes of our nation’s investment in the COE enterprise.

As a colleague of Dr. Wright Brown for many years, I know she has dedicated her professional career to collaboration, team building, and institutional partnerships that strengthen our readiness and thus our public safety. Drs. Wright Brown, Peters, and Nyarko are uniquely positioned to provide this independent, unbiased analysis of the COEs, which should be welcomed by all who share their commitment to the safety and security of future generations. Given my nearly 40 years of service to emergency management, security, and infrastructure protection, I have seen thousands of programs, initiatives, and transformational technologies emerge, grow, and in many cases, perish as institutional commitments or inspirational leadership falters. It is imperative that from time to time we stop, reflect on what we have done, and learn what worked, what had a positive impact, and why it made a difference. This book will make a major contribution to that assessment, the prioritization of research ahead, and to the enhancement of educational opportunities for the homeland security workforce of our future.

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Robert J. Coullahan is a leader in national preparedness; critical infrastructure protection; Command, Control, Communications, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems; and advanced technology development and integration. After completing active US Army duty in the 1970s, he relocated to Washington, DC area and for over 35 years has supported government and commercial operations. He served in management roles for over 20 years with Science Applications International Corporation (SAIC), where he was Senior Vice President. For five years, he served as Vice President for Government and International Programs, leading an award-winning university consortium that created the World Data Center-A for Human Interactions in the Environment for the US Global Change Research Program. He is the President and Founder of Readiness Resource Group Incorporated (RRG), a veteran-owned business supporting professional services for homeland security, infrastructure resilience, and energy and transport systems. He is board certified in emergency management, security management, and continuity management. He attended Rutgers University and earned his bachelor’s degree from the University of California and both an M.S. in Telecommunications and an M.A. in Security Management (Forensic Sciences) from The George Washington University.