



### MITIGATING CRISES THROUGH SOCIAL SCIENCE

The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) is working with the DHS Cybersecurity and Infrastructure Security Agency (CISA) Office of Bombing Prevention (OBP) to address operational gaps in understanding how human behavior affects positive safety and security outcomes in countering improvised explosive devices (IED) and other threats facing soft targets and critical infrastructures. OBP leads DHS' efforts to implement the National Counter-Improvised Explosive Device (C-IED) Policy and enhance the nation's ability to prevent, protect against, respond to, and mitigate the use of explosives against critical infrastructure; the private sector; and federal, state, local, tribal, and territorial entities. This mission also includes the development of a diverse curriculum of training and awareness products to build nationwide C-IED core capabilities and enhance awareness of terrorist threats.

### STUDYING HUMAN BEHAVIORS AND REACTIONS IN THREAT SCENARIOS

S&T seeks to understand human behavior through case studies of previous bombing events, the evaluation of an OBP-selected training assessment, and through the development of agent-based simulation models. Findings from this evaluation will provide CISA OBP with scientific evidence to inform the design of more efficient training and education techniques to overcome the limitations presented in the current body of threat scenario guidance and trainings.

**Case Studies of Previous Bombing Events:** The findings from these research deep dives will help inform the training assessment evaluation and the agent-based models. The case studies include the bombing events at the Atlanta Centennial Olympic Park, Madrid 11M Commuter Train, 7/7 London, Boston Marathon, Brussels, and Manchester Arena.

**Evaluation of Training Assessment:** This evaluation will measure the effectiveness of the Response to Suspicious Behaviors and Items course that is offered in-person and through a virtual instructor led training.

**Agent-Based Models (ABM):** ABMs provide a flexible framework to estimate outcomes through a series of tests that adjust various parameters (e.g., threat scenarios or the human reaction to a threat) to understand how those changes

influence the likelihood of various outcomes. They combine subject matter expertise, stakeholder input, and technology to deliver actionable insights to inform CISA trainings.

### IMPACT

Evaluating human behaviors and responses during and after terrorist and targeted attacks helps enhance soft target security and prevention measures. Through these evaluations, S&T is able to provide knowledge products that critical infrastructure operators can use to enhance soft target-crowded places security. Outputs of the evaluation research will inform the design and development of future CISA OBP trainings offered to the security community.

### UPCOMING MILESTONES & DELIVERABLES

- **FY23 Q2 – Full Spectrum Report on Human Behavior in Threat Scenarios:** S&T will use a multidisciplinary social science approach to evaluate the existing knowledge landscape with regards to Human Behavior in Threat Scenarios. These findings will be used to inform the assessment of current training effectiveness and to establish baseline human behaviors for simulation
- **FY23 Q2 – Draft Boston Bombing Simulation:** This draft ABM will inform future ABMs
- **FY23 Q3 – Churchill Downs ABM:** The first ABM environment is the Churchill Downs Racetrack in Louisville, KY
- **FY23 Q4 – Mercedes-Benz ABM:** The second ABM is the Mercedes-Benz Stadium in Atlanta, GA
- **FY23 Q4 – Report on OBP Training Efficacy:** Focusing on the effectiveness of OBP Training Courses and providing insights into knowledge gained and knowledge decay over time
- **FY24 – ABM Environments 3 and 4:** The final ABM 3 and 4 locations have yet to be decided by OBP

### PERFORMERS, PARTNERS, STAKEHOLDERS

- Research Triangle Institute International, Research Triangle Park, NC
- CISA/OBP, Washington, DC
- Critical infrastructure protection operators

