

# DHS Science and Technology Directorate

## Modeling and Simulation Engine

### Technology Engines Context

The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) launched a series of high-profile, high-impact Apex programs to look strategically at the nation's security and address future challenges while supporting today's operational needs. S&T Engines were created to meet cross-cutting needs for all Apex programs.

### Impact and Vision

Through the Modeling and Simulation Engine (MS-E), best of breed modeling and simulation (M&S) subject matter expert (SME) support and tools are available to Apex and other S&T programs and DHS components. MS-E is establishing DHS S&T as a leader in federal M&S activities, through its interagency collaboration, rapid prototyping and execution support to DHS and components.

### Description and Approach

MS-E provides M&S SMEs, establishes in-house M&S capabilities and coordinates support for Apex Programs, S&T Engines, and other DHS project managers in the application of M&S to achieve program objectives. The Engine also provides recommendations and information on M&S technology, data, policies, and standards. The MS-E is establishing the DHS M&S Community of Interest (CoI), which is dedicated to promoting awareness, cooperation, reuse, and interoperability of M&S across the department to improve capacity and provide savings. The Engine monitors M&S use, trends, policies, and advancements that span interagency, international, academia, and industry in order to maintain awareness for the M&S CoI and leverage opportunities for collaboration. The MS-E facility utilizes M&S software tools, and preserves connections with repositories of mission-based models and tools from collaborative partners.

### Key Activities

- Engage Apex PMs in analyzing and establishing M&S requirements; support appropriate application of M&S within their programs
- Provide M&S SME technical assistance and leverage collaborative relationships to achieve Apex PM missions
- Support the development of M&S Support Plans and Requirements Forecasting
- Coordinate a DHS S&T in-house M&S execution capability through use of existing tools and resources; surge as needed to support Apex programs and other Engines mission needs
- Maintain situational awareness of M&S trends and advancements; support industry/academia/interagency, and international collaboration in the area of M&S as pertinent to DHS
- Establish an M&S Working Group "Community of Interest" that develops and sustains a DHS M&S repository enhancing situational awareness and collaboration

### Requirements and Risk Analysis

MS-E provides requirements and risk analysis (RRA) support to the Apex programs. MS-E partners with Apex PMs, SMEs, and the user community to ensure traceability of requirements through the Apex program lifecycle, and confirms technical and programmatic risks are effectively managed.

### Key Successes

**Amplified public security for National Security Special Events** MS-E provided the United States Secret Service with SMEs and technical over-sight for crowd ingress, egress, and emergency evaluation of crowd dynamics that were used at the 2016 Republican and Democratic National Conventions and the 2017 Presidential Inauguration.

**Executed and operated Counter Small Unmanned Aerial Systems Advisory and Review Toolkit (C-SMART) in support of Program Executive Office for Unmanned Aerial Systems (PEO UAS)** MS-E supported the PEO UAS in the execution and operation of C-SMART which provides enhanced capabilities to the HSE that optimizes sensor layouts of CUAS systems for specific events and infrastructure, conducts forensic analysis of engagements, and enables stakeholders and decision makers to assess and improve the efficiency of UAS-related security postures.



**Homeland Security**

Science and Technology

To learn more about the S&T Modeling and Simulation Engine, contact [technologyengines@hq.dhs.gov](mailto:technologyengines@hq.dhs.gov)