



NATIONAL TRAINING AND SIMULATION ASSOCIATION

**Congress**

*Training 2015*  
RELEASED IN NOVEMBER 2010

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## Acknowledgements

Once again, NTSA is proud to have sponsored an effort which has resulted in a comprehensive assessment of future needs in the training and simulation markets. This year's effort was especially difficult because of the increased security and extensive budget changes.

The effort required many hours of hard work and dedication. I personally commend the NTSA members, government organizations, and commercial companies who contributed to the success of this venture.

I extend special thanks to Dr. Linda Brent, of The ASTA Group, LLC, who chaired the *NTSA Training 2015*. We could not have completed this high quality product without her leadership and organizational skills.

The Congressional Perspective Committee conducted customer interviews, research, and authored the market survey report. The Congressional Perspective Committee members are listed below:

- Rich Bensinger, General C4S - Battle Management Systems (Co-lead)
- JC Williams, Goodrich Corporation (Co-lead)
- Eric Bergantz, The Boeing Company

It is with much gratitude that I thank the government individuals and organizations, who participated in the *NTSA Training 2015*. Once again, those responsible for developing requirements, and acquiring and using training and simulation systems and products were most forthcoming with their perspectives.

*RADM Fred Lewis (U.S. Navy Ret.), President*

*National Training Systems Association*

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# Congressional Perspective

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## 1.0 Introduction

The Congressional perspective on the future of Modeling and Simulation (M&S) for training was gleaned through interviews with select Members of Congress, focusing on members and staff of the Congressional Modeling and Simulation Caucus, and through research of available published information.

The potential of M&S in training is vast and varied. M&S resources can be leveraged to address training, planning, and problem-solving needs. No matter the national challenges— the Global War on Terror (GWOT), oil spill recovery, pandemic flu response— M&S can help improve federal government response efforts, by improving the training and planning for those responses.

## 2.0 The Congressional Modeling and Simulation Caucus

The Congressional Modeling and Simulation Caucus (M&S Caucus) was established to showcase M&S initiatives and promote the M&S industry. The Caucus also serves as a forum to understand the policy challenges facing this growing and versatile technology. As of September 2010, Congressional members of the M&S Caucus included:

|                                   |                                    |
|-----------------------------------|------------------------------------|
| Randy Forbes (R-VA-04) (Co-Chair) | Solomon Ortiz (D-TX-27) (Co-Chair) |
| Robert Aderholt (R-AL-04)         | Ken Calvert (R-CA-44)              |
| John Carter (R-TX-31)             | Mike Conaway (R-TX-11)             |
| Susan Davis (D-CA-53)             | Suzanne Kosmas (D-FL-24)           |
| Doug Lamborn (R-CO-05)            | Jim Matheson (D-UT-02)             |
| Jeff Miller (R-FL-01)             | Glenn Nye (D-VA-02)                |
| Todd Russell Platts (R-PA-19)     | C.A. Dutch Ruppersberger (D-MD-02) |
| Bill Foster (D-IL-14)             | Virginia Foxx (R-NC-05)            |
| Jim Gerlach (R-PA-06)             | Phil Gingrey (R-GA-11)             |
| Maurice Hinchey (D-NY-22)         | Joe Sestak (D-PA-07)               |
| Bobby Scott (D-VA-03)             | Zach Wamp (R-TN-03)                |
| Joe Wilson (R-SC-02)              | Rob Wittman (R-VA-01)              |

Source: <http://forbes.house.gov/Biography/msmembers.htm>

## 3.0 Legislative Trends Shaping Congressional Spending

Future Congressional spending will clearly be impacted by defense initiatives and domestic spending designed to grow and recover the economy, as well as by concerns over environmental sustainability.

1. The need to support the readiness and sustainment of U.S. military forces so that they can effectively conduct the ongoing Global War on Terror (GWOT) will be balanced with

efforts to stem the growing federal debt, grow the economy, and pay entitlement programs. This situation has and will constrain budgets for some military training programs, however, these factors are anticipated to drive heavier reliance on preliminary analyses activities designed to justify expenditures and build efficient training systems.

2. Concerns about terrorism and domestic security are anticipated to drive spending on and investment in efforts to secure and protect cybersecurity, infrastructure, and borders (see accompanying report on the Department of Homeland Security market).
3. Environmental sustainability measures, intertwined with economic and national stability and security concerns will continue to drive legislation and federal spending, focusing on research and initiatives designed to decrease in reliance on petroleum fuels.

Investment in modeling and simulation training (MS&T) will also likely increase, as it becomes viewed as an avenue to yield longer term savings. Congressional support for modeling, simulation, and training (MS&T) is becoming increasingly coherent and focused. Members clearly believe that modeling and simulation can improve training, reduce operation and maintenance costs, and increase the lifecycle of weapons systems. They are directly addressing those priorities with multiple agencies within DoD and the Federal Government.

### **3.1 Highlights of the Five-Year Defense Plan**

Overall, the budgetary implications of DoD current plans are similar to those described in Congressional Budget Office's (CBO) previous projections. Carrying out plans proposed in the Five-Year Defense Plan (FYDP) would require sustaining annual defense funding over the long term at higher real (inflation-adjusted) levels than those that occurred at the peak of the buildup in the mid-1980s.

Four factors in particular account for the projected high level of defense spending under the FYDP:

1. Plans to purchase more new military equipment over the next several years and then to sustain that rate of procurement over the longer term;
2. Plans, as part of military transformation, to develop and eventually produce weapon systems that provide new capabilities—systems whose estimated costs are also increasing;
3. Plans to increase the size of military forces and the growing costs of pay and benefits for DoD's military and civilian personnel; and
4. Plans to meet the rising costs of operation and maintenance (O&M) for aging equipment as well as for newer, more complex equipment.

In CBO's projection, defense resources average about \$573 billion annually (in 2010 dollars) from 2011 to 2028, or about 7 percent more than the \$534 billion in total obligation authority (TOA) the Administration requested in its regular 2010 budget.

Table 3-1: Congressional Budget Office Defense Budget Projections

| <b>Resources for Defense in Selected Years</b>              |                 |                        |            |            |            |            |
|---|-----------------|------------------------|------------|------------|------------|------------|
| (Billions of 2010 dollars)                                  |                 |                        |            |            |            |            |
|   | Actual<br>2009  | Requested<br>2010      | Projected  |            |            | Average    |
|   |                 |                        | 2013       | 2020       | 2028       | 2011–2028  |
| <b>Regular Defense Budget</b>                               |                 |                        |            |            |            |            |
| Acquisition   |                 |                        |            |            |            |            |
| Procurement   | 113             | 109                    | 120        | 124        | 115        | 125        |
| Research, development, test, and evaluation                 | 81              | 79                     | 57         | 61         | 54         | 59         |
| <b>Subtotal</b>   | <b>194</b>      | <b>187</b>             | <b>177</b> | <b>185</b> | <b>163</b> | <b>185</b> |
| Operation and Support                                       |                 |                        |            |            |            |            |
| Military personnel  | 127             | 136                    | 142        | 157        | 178        | 157        |
| Operation and maintenance <sup>a</sup>                      | 246             | 188                    | 199        | 221        | 247        | 220        |
| <b>Subtotal</b>   | <b>373</b>      | <b>324</b>             | <b>341</b> | <b>378</b> | <b>425</b> | <b>376</b> |
| Other   | 28              | 23                     | 11         | 11         | 13         | 12         |
| <b>Total</b>  | <b>595</b>      | <b>534</b>             | <b>530</b> | <b>575</b> | <b>605</b> | <b>573</b> |
| <b>Other Resources</b>                                      |                 |                        |            |            |            |            |
| Additional Supplemental, Emergency, and Contingency Funding | 74 <sup>b</sup> | 130                    | n.a.       | n.a.       | n.a.       | n.a.       |
| <b>Total</b>  |                 |                        |            |            |            |            |
| <b>Including Additional Funding</b>                         | <b>669</b>      | <b>664</b>             | <b>530</b> | <b>575</b> | <b>605</b> | <b>573</b> |
| <b>Including Total Unbudgeted Costs</b>                     | <b>n.a.</b>     | <b>682<sup>c</sup></b> | <b>573</b> | <b>634</b> | <b>670</b> | <b>632</b> |

Source: Congressional Budget Office.

Note: n.a. = not applicable.

- For the current analysis, CBO folds the revolving funds into the appropriation for operation and maintenance. Those funds generate receipts from fees charged to customer organizations in the military services and defense agencies and may also receive appropriations.
- Excludes \$74 billion in other supplemental and emergency funding allocated among the appropriation titles listed above.
- Includes \$17 billion that the Administration has not requested but that CBO projects could be needed to fund either contingency operations or other unbudgeted costs.

Source: Congressional Budget Office. *Long-Term Implications of the Fiscal Year 2010 Defense Budget*. January 2010.

### 3.2 Cybersecurity

As reported in the June 2010 issue of *The IIITSEC Newsletter*, Congressman Forbes called for study into use of M&S to strengthen DoD cybersecurity, citing U.S. heavy dependence on computer systems, the vulnerability of information to cyber-threats and previous cyber-attacks emanating from other countries.

The House fiscal 2011 National Defense Authorization Act, SEC 1046, has acknowledged cybersecurity as “one of the most serious national security challenges facing the United States” and mandates study of (1) the current use of, and potential applications of, modeling and

simulation tools to identify likely cybersecurity methodologies and vulnerabilities within the Department of Defense and (2) the application of modeling and simulation technology to develop strategies and programs to deter hostile or malicious activity intended to compromise Department of Defense information systems.

Study findings are to be submitted in a report to the Committees on Armed Services of the House of Representatives and the Senate by the 2012 New Year, containing recommendations for implementing tools to improve cyber security within the DoD.

In the meantime, cybersecurity priorities are reflected in the federal budget. Listed below are top Cyber Security Programs identified by FedSources in their *FY2011 Top Opportunities Report* (<http://www.fedsources.com>).

1. The Department of the Air Force, Air Force Research Laboratory (AFRL), Information Directorate has a requirement for Agile Cyber Technology (ACT). Emphasis is placed on: a) development of technology capability solutions that address specific user requirements; b) delivery of prototype technologies for evaluation and feedback in the context of the user's operational environment; and c) provision of a mechanism for user acquisition of limited product quantities required for operational introduction of products. Estimated value of \$480 million.
2. The Department of the Navy, Space and Naval Warfare Systems Center, Atlantic (SSC Atlantic) is soliciting information from potential sources to provide support to ongoing efforts in the GWOT. The contactor shall provide functional and technical expertise supporting of a wide range of DoN and DoD technologies, activities, programs, and systems. Estimated value of \$249 million; Small business set-aside.
3. The Department of the Navy, SSC Atlantic also requires Engineering Support Services for Information Operations (IO), Information Assurance (IA), and Information Warfare (IW). The majority of these initiatives will support efforts in one or more of the following technical areas that will incorporate a full range of IO/IA/IW disciplines, including, but not limited to; Program Management, Network Systems Security (NSS) Support, IA Certification, Test and Evaluation Support, Cryptographic Products Support, Systems Engineering, Architecture, Integration and Technical Support, and Integrated Logistics (ILS) and Life Cycle Support. Estimated value of \$249 million; Full and open competition.
4. The Department of Homeland Security, United States Secret Service (USSS), has a requirement for qualified vendors to assist with the Block 1: IT Infrastructure Modernization, Database Architecture and Maintenance and Cyber Security initiative. The DHS USSS is performing a predecessor acquisition in advance of the IT Infrastructure Modernization, Database Architecture and Maintenance and Cyber Security initiative. The purpose of this separate task will be the rapid acquisition of hardware elements and their installation, configuration and integration into the current USSS IT infrastructure.
5. The Department of Treasury, Internal Revenue Service is seeking to identify potential sources for Enterprise Security Audit Trails (ESAT) Project. The purpose of this project is to develop an audit trail solution and strategy that will modernize audit event



identification, generation, collection/storage, reduction/reporting, review/action on operating systems, databases, web servers, critical FISMA applications and their related network components.

#### **4.0 Congressional Support for Modeling, Simulation, and Training**

Continuing demonstrations of new MS&T technologies in both the military and civilian communities have convinced Congress that there are new, relevant capabilities available. Evidence of Congress' growing support of MS&T is evidenced in several legislative actions.

**House Resolution (H.R.) 487**, introduced in June 2007, recognized the contributions of M&S and identified M&S as a National Critical Technology. Historically, a National Critical Technology is one that has particular value to the national security of the United States and/or significant economic impact on the country. The resolution also commends members of the modeling and simulation community in government, industry, and academia who have contributed to the modeling and simulation efforts that have developed essential characteristics of our nation. This resolution passed in the full House of Representatives by voice vote.

Congressman Bobby Scott (VA-03) introduced **H.R. 4165** in 2007. This bill would provide grants to encourage and enhance the study of modeling and simulation at colleges and universities. The bill would make grants of \$750,000 available to schools that already have an established modeling and simulation program and also to schools that wish to establish a new program. The bill would require schools to develop matching funds as well to demonstrate their commitment to the project. Currently, a limited number of institutions of higher education have M&S programs, including undergraduate and graduate degree programs. This competitive grant program will provide a critical source of funding for colleges and universities that want to expand and improve their M&S programs. The grant will also provide important seed money for colleges and universities that do not have a program to establish a Modeling and Simulation program. It was referred to the House Committee on Education and Labor, and then to the Subcommittee on Higher Education, Lifelong Learning, and Competitiveness (2/5/2008).

**H.R. 4321**, Enhancing Safety in Medicine Utilizing Leading Advanced Simulation Technologies to Improve Outcomes Now Act was also introduced in 2007. This Act amends the Public Health Service Act to require the Director of the Agency for Healthcare Research and Quality to conduct and support research, evaluations, initiatives, and demonstration projects, and provide grants or enter into contracts or cooperative agreements, to enhance the deployment of medical simulation technologies and the incorporation of such technologies and equipment into medical, nursing, allied health, podiatric, osteopathic, and dental education and training protocols. Specifically, this Act requires the Director to:

- Establish medical simulation centers of excellence;
- Promote innovation by conducting and supporting research on complex or challenging medical simulation and interdisciplinary simulation technologies and developing an electronic clearinghouse of such technologies;
- Award grants for purchasing, incorporating, and deploying such technologies for training of physicians, nurses, allied health professionals, and qualified students; and

- Establish an advisory panel to make recommendations on how to structure programs established by this Act.

H.R.4321 also establishes the Federal Medical Simulation Coordinating Council within the Department of Health and Human Services (HHS). This resolution was referred to the House Committee on Energy and Commerce and subsequently to the Subcommittee on Health in December 2007.

Congressman J. Randy Forbes (VA-04) successfully amended **H.R. 5658** in 2008 to include a study to recommend standards for modeling and simulation tools used by the DoD. H.R. 5658 is the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009. It authorized appropriations for FY2009 for the Army, Navy and Marine Corps, and Air Force for aircraft, missiles, weapons and tracked combat vehicles, ammunition, shipbuilding and conversion, and other procurement.

This provision secured \$800,000 for the Virginia Modeling, Simulation, and Analysis Center (VMASC) at Old Dominion University to develop M&S standards for the DoD, aimed at boosting effectiveness of M&S budget models to save time and money across the Department. Currently, the DoD uses modeling and simulation to analyze annual budgets submissions and to help make budget decisions. However, there is no standard for budget models used across the DoD, often making confidence in models uncertain.

“Modeling and simulation is a unique tool that has the potential to save significant resources in terms of time and dollars. Unfortunately, the full potential of M&S is not being fully realized simply due to the ad hoc way budget models are currently being utilized across the DoD,” said Forbes. “Creating industry standards will put budget models on the same page, create a level of confidence with models’ estimates, and will make budget estimates more accurate.”

Forbes’ amendment required the Comptroller General of the United States to perform an inventory of M&S tools used by the DoD. In addition, it would require the Secretary of Defense to contract with a federally funded research and development center to examine the requirements for and capabilities of M&S tools used by the DoD to support the annual budget process.

The future intent of the study is to determine what the recommended model standards should be and to ensure that budget models are properly funded, managed, and operated by highly qualified individuals. As Congressman Forbes stated, “Ensuring that budget models are standardized will allow the DoD to better see which models are successful and which need to be improved, so we can be sure we are making the best decisions on behalf of our defense needs.”

John J. Young, the Under Secretary of Defense for Acquisition, Technology, & Logistics, recently recognized M&S as a vital approach for Department of Defense Test and Evaluation (T&E) in a **memo sent to the Secretaries of the military departments and the Chairman of the Joint Chiefs of Staff**. Secretary Young noted that T&E should be conducted in a continuum of live, virtual, and constructive system and operational environments in an effort to realize the benefits of M&S. The memo followed a DoD report to Congress in which M&S was

listed as a tool to exploit in addition to traditional test and evaluation approaches. The following is an excerpt from the report:

*"Test and Evaluation should exploit the benefits of appropriate Modeling and Simulation (M&S). M&S has a role in test planning, determination of readiness to test (pretest predictions), and evaluation. "Evaluations should include a baseline comparison of current capabilities and should take into account all available data and information. Many opportunities exist for combining information: DT, OT, training data, test and field performance data of similar systems, M&S, and with Evolutionary Acquisition --- test and field performance of earlier versions of the same system. Combining information can be more beneficial for test design and for operational evaluation than in the case of traditional acquisitions."*

Source: Department of Defense Report to Congress on Policies and Practices for Test and Evaluation, July 2007, page 13.

The **M&S Stakeholders Meeting** held in Washington, DC on 1 July 2010 was hosted by the Congressional M&S Caucus. At this meeting of Government, Industry, and Academia, a consensus was reached among the 41 attendees: a national strategy is needed to advance the nation's newest technology, modeling and simulation (M&S). Discussion focused on five areas that should be addressed to advance M&S utilization.

**Public Awareness** – The public has limited understanding and awareness of the term “modeling and simulation” even though M&S-based products are used on a daily basis. A compelling narrative using references to M&S utility and capability, as well as savings in money, time, and lives and illustrations of ROI will help improve awareness and credibility of M&S.

**Education and Future Workforce** – The M&S industry's future depends on a well-trained workforce. There is a clear need for curriculum standards and a workforce educated at credentialed institutions. Any M&S National Plan needs to have a strong focus on Education. A “national literacy” campaign is in order, and the teaching of scientific thinking, engineering concepts at the K-12 level and to general public should be a priority. This will promote the M&S industry and encourage students to pursue STEM education.

**Professional Development** – The lack of trained M&S professionals impedes the growth/future of the industry. Four areas that would improve M&S professional capacity are (1) the approval of NAICS M&S industry codes, (2) M&S certification, (3) compilation of M&S Body of Knowledge, and (4) Inter-Society (e.g., SISO, SCS, NTSA, SSH, etc.) cooperation among M&S professionals.

**Funding** – DoD has historically been the largest customer for the M&S industry. In addition to DoD, it is important to persuade entities such as the National Science Foundation and the National Institute of Health to get involved in M&S related R&D projects. The budgeting power of the Executive Branch should be sought, and lobbying efforts may need to be revitalized to make progress on the M&S enterprise issues.

Cooperation across User Communities and Government Entities –The House M&S Caucus is an example of an organization and/or actions that exemplifies the type of cooperation imperative to the M&S Community. Formation of a Senate Caucus and identification of a “champion” (person and/or office) within the Executive Branch is imperative. The Community needs a strong champion for M&S in the White House. The M&S Stakeholders group could serve as an advisory board to the Caucuses and the Office, with the Caucuses helping to drive the (Executive Branch) office’s agenda.

It was determined that a follow-up session of the Stakeholders Coalition should occur in approximately six months to further 2010 M&S Leadership Summit objective to create a “National Plan.” A smaller group (or groups) will meet to discuss and make recommendations back to the larger body. The focus of the next meeting(s) will be building a set of achievable goals and tangible priorities with a clear plan to reach successful outcomes. The organizational concepts (infrastructure) and scope of efforts should be discussed and defined, providing a collaborative and cooperative National Plan for action. This plan of action would provide a roadmap for Government entities, allowing them to fully exploit, engage, and continue to develop M&S capabilities at the national level.

**The House Readiness Subcommittee** met On 20 July 2010 to hear testimony on the use of modeling and simulation to enhance military readiness. Individuals providing testimony included:

- Vice Admiral William Burke, USN Deputy Chief of Naval Operations Fleet Readiness & Logistics (N4)
- Major General Stephen R. Layfield, USA, Director, Joint Training and Joint Warfighting Center, U.S. Joint Forces Command
- Major General Marke F. Gibson, USAF, Director of Operations, Deputy Chief of Staff for Operations, Plans and Requirements, Headquarters U.S. Air Force
- Rear Admiral Fred L. Lewis, USN (ret), President, National Training and Simulation Association (NTSA)

Through this testimony, Members of Congress were informed about the criticality of M&S training systems in the expansion and transformation of current and future warfighter readiness. Topics included U.S Navy Readiness Modeling (i.e., verification, validation and accreditation of the models employed) and how Readiness Modeling is used for budget planning. Members were also informed about successes in the U.S. Air Force employment of M&S in the conduct of training.

Testimony also provided insight into M&S capability to keep the joint force at maximum effectiveness level. M&S can instill adaptability and flexibility where possible, before the force is engaged in combat. M&S has value in enhancing joint training, experimentation and testing needs in today’s complex training and operational environments.

There are significant challenges facing the M&S community. The testimony also provided insight into how industry is working with the government to overcome those challenges and improve the capabilities and access of M&S to military components.

**The M&S Leadership Policy Summit** and the **Capitol Hill M&S Expo** are hosted each year by the Congressional M&S Caucus. The Policy Summit, held in the Hampton Roads, VA area, brings together key members of the M&S community from industry, government and academia to establish annual policy goals. The Expo, held in the U.S. Capitol building, is the premier event on Capitol Hill to showcase advances in M&S to Members of Congress.

## 5.0 Summary

Congress continues to provide broad-based support and focused interest on MS&T topics, principally focused through the actions of the Congressional M&S Caucus. Budget advocacy for MS&T is present, and has been demonstrated in legislative actions and other Congressional activities. Congressional Members and staff understand that M&S technologies enable DoD components to maintain high levels of military readiness. Use of M&S can improve training by delivering high-fidelity versatile training applications. Use of M&S also reduces costs associated with the operation and maintenance of static equipment, increasing the overall lifecycle of weapons systems. The potential gains associated with use of M&S in training apply to the civilian realm as well.

Given the spending outlook, the use of M&S is likely to grow as DoD components seek to leverage the cost gains presented by use of M&S in training systems. Advancement of cyber security initiatives presents opportunities for growth in industry.

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