National Defense Industrial Association
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Test and Evaluation of Autonomous Vehicles
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Test Resource Management Center (TRMC)

**TRMC Mission**

- **T&E Infrastructure**
  - MRTFB Planning, Assessment and Oversight
  - Strategic Plan for DoD T&E Resources
  - T&E Budget Certification

- **T&E Investments**
  - Test & Evaluation/Science & Technology (T&E/S&T) Program
  - Central Test & Evaluation Investment Program (CTEIP)
  - Joint Mission Environment Test Capability (JMETC)
  - National Cyber Range (NCR)
The STEWARD of the DoD Test Infrastructure
Major Range and Test Facility Base (MRTFB): The “Critical Core”
23 Sites: Army-8; Navy-6; Air Force-7; Defense Agency-2

• Created by Congress
• 25,000+ Personnel
• ~$4B in Funding Annually

• Army – 5.5M acres Land
• Navy – 1M acres Land, 165K sq mi Sea, 103K sq mi Air
• Air Force – Western Ranges ALONE 5M acres Land

Legend:
Army, Navy, AF, Defense Agency

- Cold Regions Test Center
- NUWC Keyport (Nanoose & Dabob Ranges)
- NAWC-WD China Lake
- West Desert Test Center
- Nevada Test and Training Range
- Utah Test and Training Range
- Electronic Proving Ground
- Yuma Test Center
- 412th Test Wing
- 30th Space Wing
- PMRF
- DISA
- DISA,JITC
- PMRF
- 45th Space Wing
- U.S. Army Kwajalein Atoll Reagan Test Site
- White Sands Test Center
- Tropic Regions Test Center, various locations
- NAWC-AD Patuxent River
- Patuxent River
- NAWC-WD Point Mugu
- Arnold Engineering Development Complex
- 96th Test Wing (Includes 96th Test Group)

• Total Plant Replacement Value $13.3B (1.6% of the DoD total)

(PRV Source: MRTFB MILCON Report (House Report 114-102 to Accompany H.R. 1735))
Autonomy presents unique challenges/opportunities to the tester.
Objective: Determine the methodologies, infrastructure, and resources required to efficiently test technologies needed to field autonomous systems

To be autonomous, a system must have the capability to independently compose and select among different courses of action to accomplish goals based on its knowledge and understanding of the world, itself, and the situation.

Defense Science Board
Driving to an Autonomy T&E Solution

**T&E Tools**
- Trust & Risk Measurement
- Autonomy Function Introspection Tools
- Intelligent Planning Tools
- Enterprise (Big Data) Analytics

**Methodologies**
- Methods, metrics, processes for autonomy
- Standard test cases, interfaces
- Training & education
- Policy development & coordination
- Culture

**Resources**
- High fidelity M&S architectures
- Autonomy and environment models
- World Models (including MRTFB models)
- Agile and adaptive ranges
- Scalable