

# 2018 Annual Missile Defense Small Business Programs Conference



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# Today's Realities

**POTUS, 23 August 2017:** *"We are committed to expanding and improving a state of the art missile defense system to shoot down missiles in flight. And we are getting better and better at it. It's actually incredible what's taking place. We will develop better surveillance and long-strike capabilities to prevent our enemies from launching them in the first place."*

**SECDEF statement, 20 September 2017:** *"...if we fail to adapt at the speed of relevance, our forces will lose..."*

**CJCS, 3 October 2017:** *"Based on the current capacity of the North Korean threat, both the type and the amount of missiles that they possess, we can protect Hawaii today against an ICBM. We can protect the continental United States against an ICBM... As the capacity of the threat increases - that is the size, not just the lethality, of missiles that they may possess - we need to be concerned about ensuring that our ballistic missile defense capability keeps pace with that threat. We do think an increase is warranted."*

**USD (AT&L), 10 October 2017:** *"It's all about velocity. We are trying to get stuff downrange quickly."*

**POTUS, 22 December 2017:** POTUS designates funding for MDA's FY18 Budget Amendment Missile Defeat and Defense Enhancement effort as *"emergency requirements."*

**The Time for Delays and Studies and Objections Is Over...The Threat Has Voted and Continues to Visibly Vote**



# Missile Defense Agency

## Missile Defense Agency Mission

To develop and deploy a layered Ballistic Missile Defense System to defend the United States, its deployed forces, allies, and friends from ballistic missile attacks of all ranges and in all phases of flight



**Missile Defense Capability  
Globally Deployed**



# Missile Defense Agency Priorities - In Support Of The National Defense Strategy -

- Continue focus on increasing system reliability to build warfighter confidence
- Increase engagement capability and capacity
- Address the Advanced Threat



**BMDs Meets Today's Threat but Requires Additional Capacity and Advanced Capability to Stay Ahead of the Evolving Threat**



# MDA View: Defense Strategy

**Inventory – Increase Reliability and Capacity**

**Reduce Salvo Size**

**Sensor Coverage**

-LRDR, HDR, Pacific Radar, Atlantic Radar, Airborne EO/IR

**Adding an Aegis Layer to GMD**

**Space Sensor Layer**

**Multiple Kill Vehicles**

- Multiple objects per interceptors

**Boost Phase Kill**

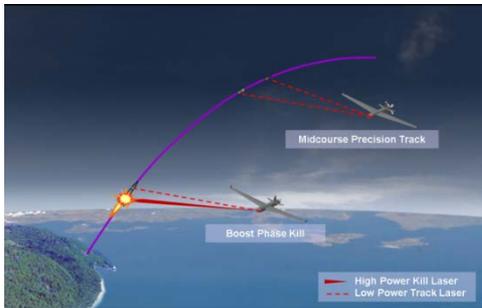
- High Energy Lasers  
- Kinetic Weapons

**Hypersonic Vehicle Defense**

**Potential Space-Based Interceptor**



*Improving Cost Effectiveness versus Complex Threats  
Multi-Domain System Integration into C2BMC*



**Increasing Capability**



# Multi-Object Kill Vehicle

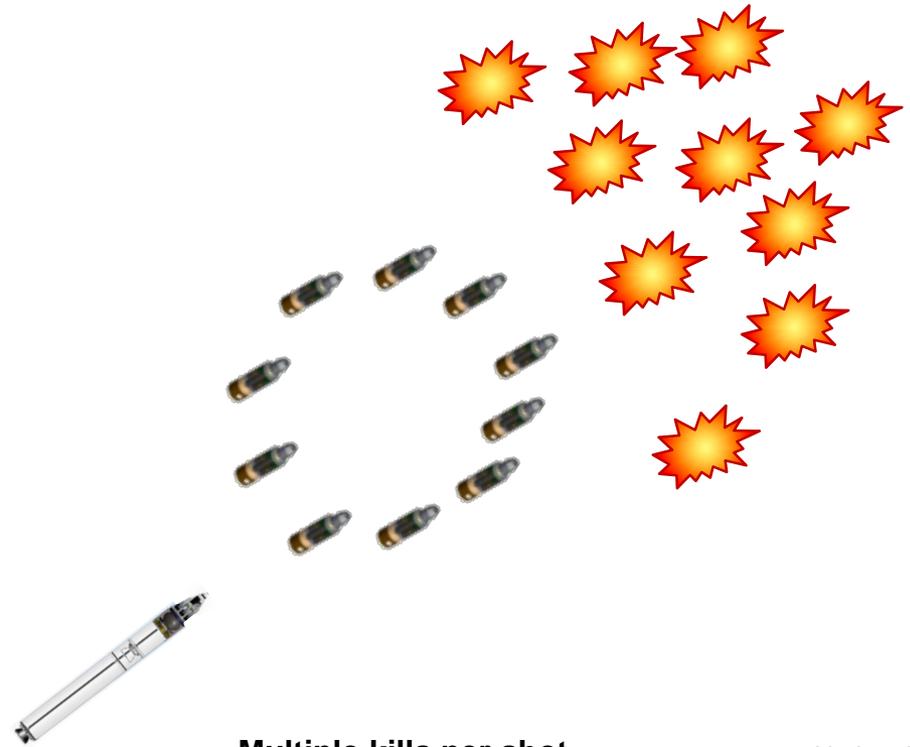
**PRESENT**



**Single kill per shot**

Notional

**FUTURE**



**Multiple kills per shot**

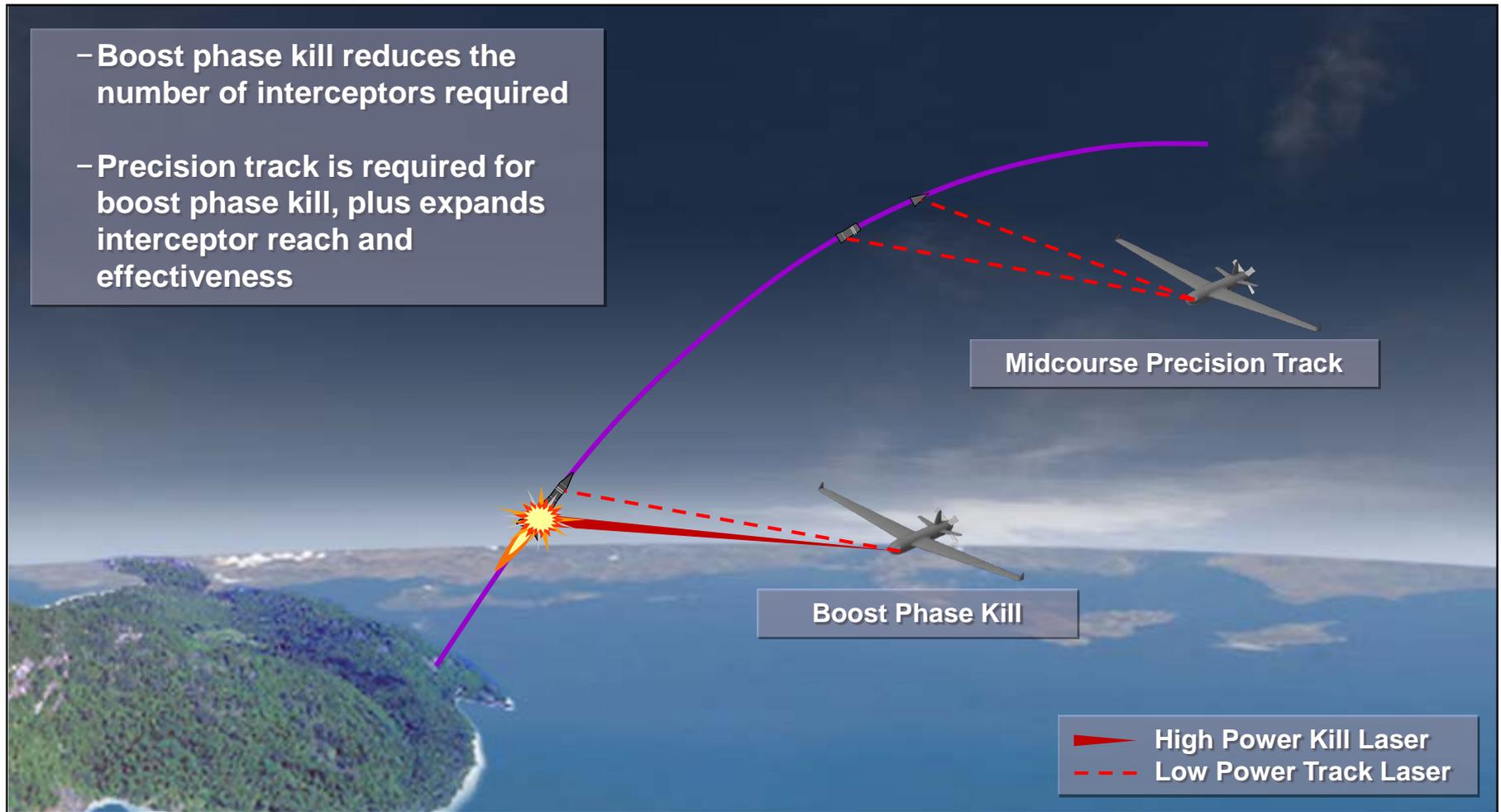
Notional

**Multi-Object Kill Vehicle Enhances Midcourse Defense:  
Destroy Lethal Objects With A Single Interceptor**



# Directed Energy in the BMDs

- Boost phase kill reduces the number of interceptors required
- Precision track is required for boost phase kill, plus expands interceptor reach and effectiveness





# Demonstrate Precision Tracking



- Two MQ-9s for stereo track
- MTS-C Sensor with multiple cameras
- Unique airborne processor
- Forward chin mount to improve sensor field of view

MTS-C = Multi-spectral Targeting System, Type C



- **Extended Range Upgrades**
  - Larger Wings (more fuel and lift)
  - Ice Protection (higher altitude)



- **Incorporate tracking laser**
  - Single platform operations
  - Increased precision and range

**Demonstrate Acquisition & Tracking at Operational Ranges**



# Technology Interest Areas

- **Interceptor Technology**
  - Guidance, navigation, & control
  - Batteries & power systems
  - Advanced materials
    - High temperature
    - Light weight
  - Seeker technology
  - Rad-Hard technology
  - Deployment systems
  - Lightweight composites
  - Propulsion & control technologies
    - Improved specific impulse
- **C2BMC**
  - Advanced tracking & discrimination algorithms
  - Command & control algorithms
  - Low latency and secure communications
  - Battlespace management
  - Data fusion
  - Warfighter training
- **Modeling & Simulation**
  - Lethality
  - Battlespace environments
  - Engagement
  - Aerothermal environments
  - Technology investment evaluation
  - Test verification
- **BMDS Testing**
  - Affordable targets
  - Scene generation
  - Hardware in the loop
  - Rapid analysis software toolkits
  - Predictive analysis & modeling
  - Range safety
- **Sensors**
  - Electro-optic/infrared and radar
    - Transmit/receive modules
    - Focal plane arrays
  - Signal & data processing algorithms
  - Rad-hard technology
  - Telescopes & antennas
  - Windows & radomes



# Summary

- **Sustain advanced technology momentum**
- **Prove technology readiness through competitive demonstrations**
- **Improve discrimination by enabling persistent EO/IR sensors**
- **Transform missile defense by introducing directed energy**
- **Invest in technology to address advanced threats**