2017 NDIA Munitions Executive Summit

COL M. Gutierrez, Project Manager, Maneuver Ammunition Systems

27-29 MAR 2017
Priorities & Focus

Future Capabilities to Defeat Threats in Lethal, Contested Complex Environment

- Airburst Munitions for Mounted & Dismounted Fight - Autonomous/Programmable
- Extended Range Munitions - across the portfolio
- Increased Precision/Guided

Current Development Programs

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>7.62mm OWL</td>
<td>40mm DNT</td>
</tr>
<tr>
<td>7.62mm Lightweight Small Caliber Ammo</td>
<td>120mm AMP</td>
</tr>
<tr>
<td>7.62mm RRA</td>
<td>Stryker ONS 30 x 173mm</td>
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Emerging Needs

<p>| | |</p>
<table>
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<tbody>
<tr>
<td>5.56, 7.62 &amp; .50 Cal</td>
<td>OWL, LW Ammo, Reduced Range Training</td>
</tr>
<tr>
<td>40mm Grenades</td>
<td>HE Airburst, Door Breach</td>
</tr>
<tr>
<td>30mm Cannon</td>
<td>HE Airburst</td>
</tr>
<tr>
<td>105mm Multi-Purpose</td>
<td>HE Airburst</td>
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<tr>
<td>120mm Extended Range</td>
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</table>

Potential for Increased Production to Support the Joint Warfighter

- FY17 DoD budget with Congress - potential for significant increases in ammo buys
- PM MAS now buying all Non-Standard Ammo for CENTCOM
- FY17 projections - 950M rounds Standard/91M Non-Standard
PM-MAS
PB17 Budget Outlook
(FY17-FY21)

Spending Forecast:
- Increasing
- Consistent
- Decreasing

ARMY RDTE
$372M
FY17-FY21

<table>
<thead>
<tr>
<th>Category</th>
<th>FY16</th>
<th>FY17</th>
<th>FY18</th>
<th>FY19</th>
<th>FY20</th>
<th>FY21</th>
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DISTRIBUTION STATEMENT A:
Approved for Public Release
Scenario--Threat Based Posture

- Multi-Caliber approach to Overmatch threat capabilities
- Focus R&D Investments in that direction
- Maintain Industrial Base capacity & surge

**Small Caliber**
- **Ability to Surge:** LOW RISK
- **Significant Capacity**
  - Lake City, NTIB, Foreign
  - 7.62mm EPR limiting round

**Medium Caliber**
- **Ability to Surge:** LOW/MED RISK
  - 40mm
  - Cannon Caliber
- **Significant NTIB Capacity Available**

**Large Caliber**
- **Ability to Surge:** MED/HIGH RISK
- **LOW RISK to Surge KE Rounds**
- **HIGH RISK to Surge HE Rounds**

**CURRENT LETHALITY**
- Brass Case (Weight)
- Legacy Tracer (Vulnerability)
- Legacy AP (Threat)
- Legacy Precision (System Advancement)

**FUTURE LETHALITY**
- LSCA (Maneuverability)
- XM1161 OWL Tracer (Survivability)
- XM1158 ADVAP (Lethality)
- APTC/RRA (Flexibility)
- Improved Precision (Lethality)

**CURRENT LETHALITY**
- M430A1
- M433
- M789
- Stryker (M430A1)
- JLTV

**FUTURE LETHALITY**
- Airburst
- IRAP
- Airburst - 30 x 173mm
  - 30 x 113mm

**CURRENT LETHALITY**
- M908-HE-OR
- M1028-Canister
- M829A3/A4-SABOT
- M830A1-MPAT

**FUTURE LETHALITY**
- Multi-Purpose 105mm Round
- Current and Future MBT defeat
- ADL Equipped rounds
# Industrial Base Posture

## Key Trends

### SMALL CALIBER AMMUNITION
**(5.56mm, 7.62mm, .50 CAL, Misc)**

- Small Caliber ammunition products in relatively good position
  - Potential for Lake City AAP competition in FY18-FY19
  - Maintaining Second Source for high demand products
- Boutique Items – Close Combat Mission Capability Kit (CCMCK), Short Range Training Ammunition (SRTA) etc. more dependent on other service buys

### MEDIUM CANNON CALIBER
**(20mm, 25mm, 30mm)**

- 30x173mm Ammunition for Stryker ICV ONS
  - Short-term Urgent Materiel Release (UMR) of Ammo
- Potential 30x173mm Program of Record
  - Full Materiel Release for Army
  - Programmable Airburst Development
- New emerging requirements could increase outyear demand
  - Increased lethality for JLTV
  - 30mm AB

### MEDIUM CALIBER AMMUNITION
**(40mm Grenades)**

- Requirements could increase outyear demand
  - Low Velocity High Explosive Airburst Development
  - Potential Adoption of 40mm Door Breaching Ctg.
  - Potential High Velocity Anti-Personnel Capability on MK19
- TP-DNT production starting late FY17
- High FMS demand for M430A1

### LARGE CALIBER AMMUNITION
**(105mm, 120mm)**

- Potential for multiple IDIQ contracts to facilitate quick response to emerging FMS requests
  - Increased consumption of training rounds will drive increased production requirements starting early FY20s
- War Reserve stocks of 120mm tactical ammunition will be maintained until replaced with new production AMP and M829A4
  - Stocks of most 105mm tactical ammunition are beyond design life with no existing IB capacity for new production

### NON NATO STANDARD AMMUNITION
**(NSA)**

- High demand for Non-Standard Ammo
  - Consolidate CENTCOM procurements
  - MOA between SOCOM and PD NSA in development to procure all Non-Standard Ammo through PD NSA

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**DISTRIBUTION STATEMENT A:**
Approved for Public Release

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6
# PM MAS FY17/ FY18

## Competitive Opportunities

<table>
<thead>
<tr>
<th>Program/ Item/ Description</th>
<th>Projected RFP Release</th>
<th>Projected Award Date</th>
<th>Total Potential Contract Value</th>
<th>Contract Strategy*</th>
<th>Contract Type**</th>
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<tbody>
<tr>
<td>7.62mm Bottlenose Blank</td>
<td>AUG 16</td>
<td>MAR 17</td>
<td>$6.25M</td>
<td>C</td>
<td>IDIQ</td>
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<tr>
<td>Shotshell</td>
<td>AUG 16</td>
<td>MAR 17</td>
<td>$20.1M</td>
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<tr>
<td>120mm Tank Training</td>
<td>JUL 16</td>
<td>MAR 17</td>
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<td>Small Cal Non Recurring Engineering</td>
<td>JUL 16</td>
<td>APR 17</td>
<td>$65M</td>
<td>C</td>
<td>IDIQ</td>
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<tr>
<td>5.56mm Frangible</td>
<td>DEC 16</td>
<td>AUG 17</td>
<td>$52.8M</td>
<td>C</td>
<td>REQ</td>
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<tr>
<td>NSA IDIQ (CONUS)</td>
<td>JAN 17</td>
<td>AUG 17</td>
<td>$500M</td>
<td>C</td>
<td>IDIQ</td>
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<td>40mm Systems</td>
<td>FEB 17</td>
<td>SEP 17</td>
<td>$483M</td>
<td>C</td>
<td>FFP</td>
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<table>
<thead>
<tr>
<th>FY18</th>
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<tbody>
<tr>
<td>M830A1 Refurbishment</td>
<td>JUN/FY17</td>
<td>OCT/FY18</td>
<td>$9M</td>
<td>LC</td>
<td>FFP</td>
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<tr>
<td>Medium Caliber Family</td>
<td>DEC 17</td>
<td>JUL 18</td>
<td>$2B</td>
<td>LC</td>
<td>IDIQ</td>
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<tr>
<td>40mm IRAP</td>
<td>NOV 17</td>
<td>MAY 18</td>
<td>$28.9M</td>
<td>C</td>
<td>FFP</td>
</tr>
<tr>
<td>PM MAS Support</td>
<td>DEC 17</td>
<td>MAY 18</td>
<td>$10M</td>
<td>C</td>
<td>IDIQ</td>
</tr>
</tbody>
</table>

**Competitive (C), Small Bus Set-Aside (SBSA), National Tech. & Industrial Base (NTIB), Sole Source (SS), Limited Competition (LC)

**Firm Fixed Price (FFP), Indefinite Delivery/ Indefinite Qty. (IDIQ), Requirements Contract (REQ)

AWARDED
MAS FY17/18 DOTC Opportunities

**FY17**

**Small Caliber**
- One-Way Luminescence (OWL) - Pursuing alternate tracer compounds
- Prototype equipment, tooling, and component technologies

**Medium Caliber**
- 40mm Fuze Reliability Analysis (M549A1 & M550)
- 40mm High Velocity Mann Barrel Development/Qualification (Breeches and Other Testing Equipment)

**Large Caliber**
- Next Generation Composite Kinetic Energy Tank Ammunition Prototyping
- Improved Tank Ammunition Primer prototypes

**FY18**

**Small Caliber**
- Prototype solutions to enhance performance, affordability, and environmental effects in small caliber ammunition
- One-Way Luminescence (OWL) - Pursuing alternate tracer compounds
- Prototype equipment, tooling, and component technologies

**Medium Caliber**
- Improved performance 20mm (CRAM)
- Multi-mode LW30mm (Material & Personnel)
- Medium Caliber Airburst Munitions

**Large Caliber**
- Line of Sight - Beyond Line of Sight (LOS-BLOS) large caliber Guided Tank Munition (GTM) prototype munitions
PM-MAS Request for Industry Input

- PM-MAS has R&D Funds to execute EMD Programs for validated requirements (Most cases) – IRAD – Strategy should support Govt. vision
  - Identify/Minimize potential sole source situations at all levels of suppliers

- Create additional sources of supply for 120mm Tank Ammo components
  - Primers/Primer Components
  - KE Composite Sabot Material
  - Obturators
  - 105mm Wear Reducing Liners

- Develop supporting technologies for 120mm Guided Tank Munition and 105mm multi-purpose cartridge

- Industry input will be considered in developing acquisition strategy
Message to Industry

- Contested complex near peer adversaries create potential to be outsourced, out ranged, out protected and out of balance

- Overall Direct Fire Ammunition Production rising next few years
  - Near Peer scenarios will put upward pressure on War Reserve requirements

- Overall increase in R&D across Portfolio with focus on speed to field

- Consolidation for Non NATO Munitions
  - Requirements not going away anytime soon
  - CENTCOM / Big Army / SOCOM consolidation
# Small Caliber Ammunition

<table>
<thead>
<tr>
<th>PROJECT: Precision Munitions</th>
<th>One Way Luminescence (OWL)</th>
<th>Reduced Range Training Ammunition (RRTA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose: Develop scalable precision munition technologies to increase precision capability in multi-target and specialized missions</td>
<td>One-way visible, full day/night tracer for 5.56mm and Cal 0.50&quot; Reduced Range Training Ammunition (RRTA).</td>
<td>Develop 7.62mm training rounds for reduced Surface Danger Zones (SDZ) ranges with a trajectory match to current combat ammunition</td>
</tr>
<tr>
<td>Payoff: Engage targets at greater ranges, with increased P(h), in non-ideal/combat relevant conditions</td>
<td>Increase soldier survivability by removing tracer signature/visibility from threat</td>
<td>Allow full capability on restricted training ranges and collective training</td>
</tr>
<tr>
<td>Programmatic: FY13-17, multiple TRL 6</td>
<td>FY17-20, TRL 6</td>
<td>FY15-17, TRL5</td>
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<tr>
<td>Opportunities:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Prototype manufacturing, MANTECH initiatives</td>
<td>• Novel concepts and materials</td>
<td>• Prototype manufacturing, MANTECH initiatives</td>
</tr>
<tr>
<td>• Novel materials</td>
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<td>• Novel materials</td>
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## Medium Cannon Caliber Ammunition

<table>
<thead>
<tr>
<th>PROJECT: Advanced Lethality and Accuracy System for Medium Caliber (ALAS-MC)</th>
<th>Aviation Armaments System Technologies (AAST)</th>
<th>Accurate Rapid Controlled Hybrid Effects Round (ARCHER)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROJECT:</strong></td>
<td><strong>Aviation Armaments System Technologies (AAST)</strong></td>
<td><strong>DARPA Collaboration: Command guided, medium caliber munition that can enable mounted maneuver through engagement of multiple threats</strong></td>
</tr>
<tr>
<td><strong>PURPOSE:</strong> Part of ALAS-MC STO which is developing an integrated armament system to include family of 50mm x 228mm ammunition to include Programmable Air Bursting Munition and Armor Piercing munition</td>
<td>Selectable proximity/point detonation fuzed LW30mm ammunition for Apache and future LW30mm requirements</td>
<td>Increase number of stowed kills and reduced collateral damage while filling the cost gap between conventional bullets and precision missiles</td>
</tr>
<tr>
<td><strong>PAYOFF:</strong> Extended range and optimized lethal effects against all target sets</td>
<td>Provide burst capability and increase lethality performance against multi-domain targets</td>
<td></td>
</tr>
<tr>
<td><strong>PROGRAMMATIC:</strong> FY15-FY19, TRL 6</td>
<td>FY16-FY20, TRL 6</td>
<td>FY19-23, TRL 6</td>
</tr>
<tr>
<td><strong>OPPORTUNITIES:</strong></td>
<td></td>
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</tr>
<tr>
<td>• Warhead design</td>
<td>• Fuzing with focus on prox.</td>
<td>• Control actuation to enable high g maneuver</td>
</tr>
<tr>
<td>• Power sources</td>
<td>• Advanced warheads against personnel and light vehicles</td>
<td>• Weapon system fire control</td>
</tr>
<tr>
<td>• Prototype manufacturing, MANTECH initiatives</td>
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</table>
# Large Caliber Ammunition

**PROJECT:** Extended Line of Sight (ELOS)

<table>
<thead>
<tr>
<th>3rd Gen Forward Looking Infrared (FLIR)</th>
<th>Range</th>
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<tbody>
<tr>
<td>1st Gen</td>
<td></td>
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<tr>
<td>2nd Gen</td>
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<td>3rd Gen</td>
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<td>MLAT SEP</td>
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<td>MBDA3</td>
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<tr>
<td>AMP</td>
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<tr>
<td>ELOS Munition</td>
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**PURPOSE:** Munition capable of guiding, seeking, detecting, maneuvering, and hitting a threat target at extended line-of-sight ranges

**PAYOFF:** Complements the range capability of GEN 3 FLIR Sight System to counter growing threat posed to the Abrams Tank Fleet and the maneuver force

**PROGRAMMATIC:** FY19-21, TRL 6

**OPPORTUNITIES:** • Munition guidance to enable precision hit • Terminal sensor

**Advanced Munition Warhead Manufacturing Improvements MANTECH (AMWMI)**

**PURPOSE:** Improved Tungsten manufacturing process for kinetic energy penetrator that meet DoD directive to replace Depleted Uranium (DU)

**PAYOFF:** Single point failure mitigation for drop in replacement for medium and large caliber KE penetrators

**PROGRAMMATIC:** FY15-FY17, TRL 6

**OPPORTUNITIES:** • Life Cycle Pilot Process