Capability Area Reviews
Capability Roadmaps

• Provides Department an overall context and understanding of a mission area
  – Integrated Air and Missile Defense, Joint Battle Management Command and Control, Electronic Warfare, Land Attack Weapons

• Critical Link to roadmaps
  – Provide a framework for decision-making
    • Highlight trade spaces, inform decision-makers, and capture decisions made
    • For Land Attack Weapons – Conventional Engagement Capability Roadmap (Version 0 released, and Version 1 in work)
Conventional Engagement
Portfolio

- Large Portfolio:
  - Army, Air Force, Navy, Marine Corps
  - Air-, ground-, and surface-launched
  - Precision capability (INS/GPS, seekers, etc)
  - Direct attack to long range standoff
  - Prosecute fixed, relocatable, and moving targets
• Calendar year 2005 activities

• 2005 Overarching Integrated Product Team (OIPT) and Defense Acquisition Board (DAB) meetings

• Focus for 2006

• Way ahead
**CY 2005 Focus**

Topics of Interest

- **Energetic Technologies**
  - Warheads
  - Fuzes
  - Insensitive Munitions
- **Geo-Intelligence**
  - Targeting
  - Target Location Error*
- **SAASM Policy***

* **USD(AT&L) Special Interest**
Topics of Interest (cont)

- Moving Target Challenges
- Munitions Requirements Process
- Joint Organizational Structures
  - Joint Air Dominance Organization (JADO)
- Test/Training Range Infrastructure
- Conventional Engagement Capability Roadmap
• Completed Version 0 in late Spring
  – Incorporated two Joint Staff (J8) assessments
    • Moving Target Gaps
    • Area Weapons (submunitions) sufficiency
• Routed for 06 Review, followed by FO/GO
• Vetted through the JCIDS process
• Signed jointly by VCJCS and USD(AT&L)
• Presented at the July DAB
Version 0 Overview

• **Purpose**
  - Document an initial capabilities-based review of the DOD’s ability to attack land-based targets
  - Inform decision makers of known weapons-related issues and surface issues for action

• **Scope**
  - Focus is on Engage link of the Find, Fix, Track, Target, Engage, and Assess kill chain, specifically the weapon component
  - Included are conventional kinetic munitions in inventory or proposed for production during next two FYDPs (as of PB-05)
  - Target engagement capabilities of interest
    • Moving targets
    • Area targets
Joint Conventional Munitions Database (JCMD) – source data for Roadmap
<table>
<thead>
<tr>
<th>Table Title: Roadmap Content</th>
<th>Diagram Description:</th>
</tr>
</thead>
</table>

**Table:**

<table>
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<th>Year</th>
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<td>Description 2</td>
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<td>2025</td>
<td>Description 3</td>
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**Diagram:**

- Diagram showing roadmap content with timelines and milestones.
FY 05 CAR DAB

• ADM Direction:
  – Continue LAW IIPT; build Conventional Engagement Capability Roadmap Version 1
    • Include weapon/target pairing and surface-to-surface area fires assessments
      – Focus on gaps, overages, and identification of marginal value in inventory
    • Updated Munitions Requirements Process and test range information
  – Maintain the Joint Conventional Munitions Database and Land Attack Module
  – OUSD(AT&L), in coordination with the Joint Staff (J8) and Services, assess potential joint solutions for INS/GPS/laser-guided munitions
CY 06 Efforts

- Joint Staff (J8) completed the weapons targets pairing assessment
  - In JCIDS staffing
- The Army, in coordination with Marine Corps and Naval Surface gunfire, developed a plan of action for surface-to-surface fires assessment
  - The LAW IIPT reviewed and agreed the plan was feasible
  - The plan calls for bi-monthly Interim Progress Reports with a final assessment, JCIDS-ready by April 2007
- Continued attention to Joint Management Structures
  - Joint Air Dominance Organization
• Continued improvements in Geo-Intelligence and Target Location Error (TLE)
• Continued attention by Director, Defense Research and Engineering to allocating weapon-related Science and Technology
  – Fuze and warhead technologies
  – Power sources
• Continue to monitor Munitions Requirements Process
• Cross-weapon programmatic issues
  – Universal Armament Interface & Common Launcher
  – Weapons Data Link – Network
  – Test ranges infrastructure
Surface-to-Surface/Area Fires

- The Army, Training and Doctrine (TRADOC) has lead on this assessment
  - Working with Naval Gunfire, ground Marine Corps and Air Forces
- Assessment requires one year – completes April 2007
  - Informs CECR and POM 10 – 15
- Categories of Munitions
  - Surface-to-surface indirect fires, area fires for suppression, precision and non-precision fires, air-to-surface
    - direct fires not considered
Surface-to-Surface/Area Fires

- Scenarios/Vignettes will represent the approved Multi-Service Force Deployments (MSFD)
  - Department of Defense Analytic Agenda
  - Consistent with the Defense Planning Scenario descriptions
  - Consider multiple types of terrain such as urban, desert and mixed
- Target Sets will include mobile, fixed, hard and soft, or any combination
- Timeframe for the analysis is FYDP 2010-2015
Surface-to-Surface/Area Fires

Issues

• What are the Joint fires doctrinal, organizational, and operational concepts for Army, Navy, Air Force and Marine Corps delivered munitions?

• Where, when, and why do we need to be precise?

• What are the Joint fires capability gaps?

• What are the required C4ISR enablers?

• What redundancy or duplication of capability is needed to reduce risk?

• What target sets/profiles require what munitions?

• What are the capability trades among Joint surface-to-surface and air-to-surface fires for the comprehensive set of surface targets?

• What are the capability trades among target location error, weapon precision, and weapon effects radius for Army surface-to-surface and air-to-surface munitions for the comprehensive set of surface targets?

• How do concepts of operation and doctrine change over time to reflect force transformation?
Surface-to-Surface/Area Fires
Study Implementation Timeline

**Phases**

<table>
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<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td>Joint Doctrine</td>
<td>Previous Useful Work</td>
<td>Gaps</td>
<td>Trade space</td>
</tr>
</tbody>
</table>

**Doctrine**
- Interoperability Capability
- Capabilities
- Tasks, Conditions, and Standards
- Gaps

**Literature Search**
- ICD Joint Fires in Support of Expeditionary Operations in the Littorals
- Alternate Indirect Fire Study
- US Army Field Artillery Center
- Lessons Learned

**New Work**
- Scenario Development
- Data Calls
- Adjudicate across capabilities
- Mitigate Risks

**New Analysis**
- Gaps

**Timeline**

- **Jun-Aug 06**
  - 18th LAW CAR IIP
  - JUN

- **Sep-Nov 06**
  - 19th LAW CAR IIP
  - JUL

- **Dec 06-Feb 07**
  - 20th LAW CAR IIP
  - AUG

- **Mar-Apr 07**
  - 21st LAW CAR IIP
  - SEP

- **22nd LAW CAR IIP**
  - OCT

- **Final LAW CAR IIP**
  - NOV

  - JAN

  - FEB

  - MAR

  - Apr
Near-term:

- Army will present FCS Organizational and Operational Concept at the LAW CAR IIPT (Aug 15, 2006)

Mid-term:

- CAA present a QWARRM brief
- OPNAV and Air Force A5R present NNOR and NCAA briefs
- U.S. Marines presentation on Supporting Fires Operational Concept (TBD)

Long-Term:

- Army will present Modular Force Organizational and Operational Concept at the LAW CAR IIPT (Oct 06 – Date TBD)
Joint Air Dominance Organization (JADO)

- Mission is to produce and *maintain a coherent*, joint Air Dominance and Airborne Electronic Attack Roadmap
- A formalized process that will survive the Resource Officer tenure
- Three pillars
  - Counter-air/counter Air-defense
  - Air-launched strike weapons
  - Airborne Electronic Attack
- Charter MOA at Army Staff
Geo-Intelligence/TLE

• National Geospatial Intelligence Agency (NGA)
  – Continues activities enhancing GEOINT
    • Comprehending objects and events
    • Planning and executing operations
    • Assessing effects
  – Meets most stringent TLE requirements for weapons
    • non-expedient methods of DMPI mensuration
  – Pursuing multiple technical approaches to bring necessary accuracy and consistency to expedient methods of DMPI mensuration
Science and Technology
Resource Allocation to Weapons

- Continue to monitor DoD Fuze IPT activities
  - Technology plan status
  - Industrial base policy
  - POM 08 Issue to increase S&T
- Insensitive Munitions Technologies
- Novel energetic materials
- Thermobaric and dial-an-effect warheads
Munitions Requirements Process

- Fall of 06 will begin POM 10 MRP
  - Advance schedule from previous cycles
  - Munitions Requirements may suffer as Department focus changes
    - Force Structure, Stability Ops, Special Ops, etc.
  - Focus will be on precision munitions
  - Affect to Industrial base
    - Fewer procurements
    - Requirements such as IM drive higher costs
    - Munitions generally pay bills
Cross-Weapon Programmatic

• Universal Armament Interface and Common Launcher
• Weapons Data Link – Network
• Test Ranges Infrastructure
Summary

• A good forum for multi-organization team
• LAW CAR process has been a good communication tool
• Lots of diverse focus areas being reviewed
• We continue to investigate opportunities for improving weapons portfolio
Back-up
## Surface-to-Surface/Area Fires

### US Army Precision Munitions Candidates

<table>
<thead>
<tr>
<th>155 mm Cannon:</th>
<th>120 mm Mortar:</th>
<th>MCS/M1A2SEP/MGS:</th>
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<tbody>
<tr>
<td>• M549A1 HE w/ PGK</td>
<td>• PGMM</td>
<td>• MRM</td>
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<td>• M864 DP ICM w/ PGK</td>
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<tr>
<td>• Excalibur (Unitary)</td>
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<td>*ARV variants:</td>
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<td>• Common Smart Submunition (CSS)</td>
<td>• GMLRS (Unitary)</td>
<td>• PAM</td>
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<tr>
<td>• M2005 HE w/ CCF</td>
<td>• GMLRS (DP ICM)</td>
<td>• Hellfire</td>
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<tr>
<td>(From the Advanced Cannon Artillery Ammunition Program)</td>
<td>• Common Smart Submunition (CSS)</td>
<td>AH64/ARH:</td>
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<tr>
<td>• KEAPER - Kinetic Energy Artillery with Precision &amp; Extended Range (Excursion)</td>
<td>• ATACMS (Unitary)</td>
<td>• Hellfire</td>
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<tr>
<td></td>
<td>• ATACMS (DP ICM)</td>
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<td>• APKWS Blk I</td>
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<tr>
<td></td>
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<td>• Viper Strike</td>
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</table>

**NLOS-LS:**
- PAM

*ammunition resupply vehicle, armored recovery vehicle, armored repair vehicle
## Surface-to-Surface/Area Fires

### Joint Precision Munitions Candidates

<table>
<thead>
<tr>
<th>US Air Force/Naval Air Force</th>
<th>US Navy Surface</th>
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<tbody>
<tr>
<td>AGM 88 (HARM)</td>
<td>Naval Fire Support (ERGM)</td>
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<td>GBU 10,12 (LGB)</td>
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<td>GBU 31,32,38 (JDAM)</td>
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<td>AGM 65 (MAVERICK)</td>
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<tr>
<td>AGM 158 (JASSM)</td>
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<tr>
<td>GBU 29 (SDB/250 lb)</td>
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<tr>
<td>WCMD (SFW/CEM)</td>
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<tr>
<td>AGM 154 (JSOW)</td>
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<td>GBU 24 (BLU 109)</td>
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**US Marine Corps**

- HIMARS
Surface-to-Surface/Area Fires
Non-Precision Munitions Candidates
(Surface-to-Surface and Air-to-Surface)

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<td>ADD/modify</td>
<td>MK 82</td>
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<td><strong>Cannon</strong></td>
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<td>MK 82</td>
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<td>155 mm</td>
<td>MK 84</td>
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<tr>
<td>105 mm</td>
<td>CBU 87/B</td>
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<td><strong>Mortars</strong></td>
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<td><strong>AH-64</strong></td>
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<td>Hydra-Rockets</td>
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Surface-to-Surface/Area Fires

Definitions

• Area Fires
  – Area bombing (DoD, NATO) – Bombing of a target which is in effect a general area rather than a small pinpoint target
  – Area target (DoD, NATO) – A target consisting of an area rather than a single point

• Suppressive Fires
  – Suppressive Fire (DoD) – Fires on or about a weapons system to degrade its performance below the level needed to fulfill its mission objectives, during the conduct of the fire mission
  – Suppression Mission (DoD) – A mission to suppress an actual or suspected weapons system for the purpose of degrading its performance below the level needed to fulfill its mission objectives at a specific time for a specified duration
Surface-to-Surface/Area Fires

Additional Definitions

- Neutralization Fire (DoD) – Fire which is delivered to render the target ineffective or unusable

- Destruction Fire (DoD) – Fire delivered for the sole purpose of destroying material objects
Surface-to-Surface/Area Fires

Use of Area/Suppressive Fires

• **Echelons that use Area/Suppressive Fires**
  – Maneuver elements, Brigade and below (DS Artillery Battalion and organic mortars)
  – Divisions (SEAD in support of rotary and fixed-wing missions)

• **Area/Suppressive Fires are used when:**
  – Responsiveness is more important than precision
  – Target is a large formation or facility
  – Large Target Location Error is indicated
  – Target is undefined/unobserved
Surface-to-Surface/Area Fires

How are Area/Suppressive Fires:

- **Called** – FM Voice or digital call for fire, generally initiated at small unit (platoon/company) level.

- **Controlled** – Generally initiated as an “Adjust Fire” mission, meaning the firing unit delivers one round at the reported target location and the observer adjusts subsequent rounds before “Fire for Effect”

- **Delivered** – Area/Suppressive Fires may be delivered from any number of weapons systems, including Artillery and Mortars, Naval Surface Fires, Fixed/Rotary-wing CAS, as well as direct fire weapons
Surface-to-Surface/Area Fires

Roles for Area/Suppressive Fires

- Standard Roles for Area/Suppressive Fires
  - Screening the initial Point of Penetration
  - Preparatory Fires
  - Close fire support
  - Disruptive deep fires

- Non-Standard Roles for Area/Suppressive Fires
  - Clearing IEDs from routes
  - Clearing minefields
"…the physical and psychological effects of massed artillery fires were the preferred effects."

"…Close Air Support (though extremely effective on planned targets) was not a substitute for responsive artillery and mortars."

"Fire missions took less than two minutes from call-for-fire to rounds down range."
USMC AAR Comments

“Fixed wing CAS is an enormous weapon that has great effects on the ground. It took entirely too long for bombs to be dropped when Marines were in contact. The minimum safe distance of the ordnance was too great in order for even the block to be isolated and that allowed the enemy to escape countless times.”

“…rotary wing CAS was extremely timely, but the effects on target were not extraordinary.”

“Mortars and artillery proved effective by forcing the enemy to stay in the houses and not allowing the enemy to fight the Marines in the streets.”
Surface-to-Surface/Area Fires
Considerations

• Target Location Error (TLE)
  – Observer error, unobserved or undefined target

• Responsiveness
  – Situation requires immediate support vice allows time for increased precision

• Volume
  – Quantity desired to allow maneuver course of action

• Proximity of friendly forces
  – Location, degree of protection, situation