Condition Based Maintenance (CBM) for Ground Vehicles

- Collect vehicle data, GPS, vibration load, and other types
- Implementation will:
  - Enable prognostics and diagnostics
  - Improve fleet management
  - Provide realistic profiles for vehicle testing
  - Provide better data to engineers with actual drive-cycle definitions
  - Improve driver performance
  - Provide users, maintainers, commanders, and Life Cycle Management Command with near real-time characterization of vehicle operation and usage severity

- Will field limited number of CBM boxes on Tactical Wheeled Vehicles
- Will link CBM data with actual maintenance actions (i.e., part replacements)

Commercial Box with adaptable data processing tools

Analyze multiple parameters

Determine where most damage is occurring

As of 19 Oct 06
How Will The CBM Process Work?

Key CBM Enablers
- Embedded Sensors
- Plane Side Diagnostics
- Data Fusion

1. **Embedded Sensors**
2. **Plane Side Work Stations**
3. **Soldier Maintenance Actions**
4. **Production Control Office**
5. **Data Loading**

**Data Warehouse**
- Failure Analysis
- CI Development
- Flight Regimes
- Prognostics

**Actionable Maintenance and Supply Notifications**

**Engineering Analysis**
Condition Based Maintenance (CBM) for Ground Vehicles

Vehicle Instrumentation – Automated Data Collection

- HMMWV Ambulance
- HEMTT Wrecker
- HEMTT Tanker
- HEMTT Cargo

Visualization provides ability to quickly assess terrain conditions & operator characteristics

- Any collected parameter can be plotted (e.g., coolant temp, horsepower, hard brakes, …)
Safety

• DoD Top 40 – 3 of 5 listed AMC installations projected to drop from 2005 list
• Safety Rapid Review Team – increases awareness of the value and necessity of Safety and Occupational Health
• FY 06 Workers’ comp costs are down (factoring inflation)
  – 6 AMC Installations reducing Workers’ Comp Costs – active management
• Accidents, Claims, and Rates Reducing
• OSHA Voluntary Protection Program
  – Installations efforts to enroll in VPP underway
  – Corpus Christi Army Depot, Pine Bluff Arsenal, Red River Army Depot, McAlester Army Ammunition Plant, Toole Army Depot in DoD VPP Center of Excellence Program
  – Tobyhanna maintains VPP Star Status
  – Integrates Safety and Occupational Health into AMC doctrine and operations
AMC Top 15
- Alliant Techsystems Inc
- AM General LLC
- Armor Holdings Inc.
- BAE Systems
- General Dynamics Corporation
- GD GDLS Defense Group LLC
- Honeywell International, Inc.
- ITT Industries Inc.
- Kellogg Brown & Root Services, Inc.
- Northrop Grumman Systems Corporation
- Oshkosh Truck Corporation
- Raytheon Company
- Sikorsky Aircraft Corporation
- TEXTRON Systems Corporation
- The Boeing Company

AMC FY 06 Small Business Program
- Over $6.1 Billion in prime contracts (15% of AMC total)
- Nearly 29,000 small business contract actions
- AMC accounts for 35 - 40% of the Army’s small business contract obligations
- Seeking sponsorship of mentor protégé agreements – especially in manufacturing

AMC Public-Private Partnerships (in FY06)
- Partnerships ~ 340
- Totaling ~ $463M
**Public-Private Partnerships**

**Partnering at RRAD**

**Common Partnership Objectives**

- Improved performance
- Best Value for Government
- Improved reliability of product
- Strengthen and Workload Public and Private Industrial Bases Core Capabilities

<table>
<thead>
<tr>
<th>BAE Systems</th>
<th>Oshkosh</th>
<th>Armor Holdings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Systems Division Bradley</td>
<td>HEMTT</td>
<td>FMTV</td>
</tr>
</tbody>
</table>

---

![BAE Systems logo](image1)

![Oshkosh HEMTT](image2)

![Armor Holdings FMTV](image3)
Public-Private Partnerships
Partnering at CCAD
Common Partnership Objectives

- Improved performance
- Best Value for Government
- Improved reliability of product
- Strengthen and Workload Public and Private Industrial Bases Core Capabilities

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
<th>Company</th>
<th>Product</th>
<th>Company</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Electric</td>
<td>T700 Engine</td>
<td>Sikorsky</td>
<td>H-60 Hawk</td>
<td>Boeing</td>
<td>AH-64 Apache &amp; CH-47 Chinook</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

General Electric

Sikorsky

Boeing

Honeywell

T55 Series Engines
## Common Partnership Objectives

- Improved performance
- Best Value for Government
- Improved reliability of product
- Strengthen and Workload Public and Private Industrial Bases Core Capabilities

<table>
<thead>
<tr>
<th>Company</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Dynamics</td>
<td>M1 Abrams</td>
</tr>
<tr>
<td>General Dynamics</td>
<td>Stryker</td>
</tr>
<tr>
<td>BAE Systems</td>
<td>M113 AGT 1500 Engine</td>
</tr>
<tr>
<td>Honeywell</td>
<td></td>
</tr>
</tbody>
</table>

![General Dynamics M1 Abrams](image1)
![General Dynamics Stryker](image2)
![BAE Systems M113 AGT 1500 Engine](image3)
![Honeywell](image4)
**Public-Private Partnerships**  
Partnering at TYAD  
*Common Partnership Objectives*

- Improved performance  
- Best Value for Government  
- Improved reliability of product  
- Strengthen and Workload Public and Private Industrial Bases Core Capabilities

<table>
<thead>
<tr>
<th>Command Post Platform</th>
<th>Shadow UAV</th>
<th>AN/PRC112D</th>
<th>Vehicle Intercom Kits</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image]</td>
<td>[Image]</td>
<td>[Image]</td>
<td>[Image]</td>
</tr>
</tbody>
</table>

UNCLASSIFIED

Tobyhanna Army Depot

Northrop Grumman
Information Technology
## Public-Private Partnerships
Partnering at LEAD

**Common Partnership Objectives**

- Improved performance
- Best Value for Government
- Improved reliability of product
- Strengthen and Workload Public and Private Industrial Bases Core Capabilities

<table>
<thead>
<tr>
<th>BAE Systems</th>
<th>Boeing</th>
<th>Lockheed Martin</th>
<th>Macro Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts for the Buffalo Mine Protected Vehicle</td>
<td>Mounted Battle Command On The Move</td>
<td>Depot repair of Apache, TADS, PNVS</td>
<td>Avenger box fabrication</td>
</tr>
</tbody>
</table>

![BAE Systems Logo](image1)

![Boeing Logo](image2)

![Lockheed Martin Logo](image3)

![Macro Industries Logo](image4)
Fort Hood RESET/Reconstitution Partners

- **PLS, PLS-T, CBT, HEMTT**
  - M113 FOV, M2/M3 FOV, MLRS, M109A6, M992A2
  - M1A2 SEP, M93 FOX, M58 SMOKE, PM TRCS Systems
  - Power Generation, ECUs, Communications & Electronics
  - AH64D, OH58D, UH60L, AGPU
  - HMMWV, M934

- **Trailers**
  - M1A2 SEP, M93 FOX, M58 SMOKE, PM TRCS Systems

- **FMTV**
  - M113 FOV, M2/M3 FOV, MLRS, M109A6, M992A2

- **HMMWV, M934**

- **D5 & D7 Tractors**

- **Fort Hood**
ARMY PLAN
The Army will undertake a disciplined, orderly reconstitution to restore combat power.

2,054* Aircraft Scheduled
1,798* Completed

11,496 Wheels FY07
4,036 Tracks FY07
11,453 Missile Systems FY07
8,284 Generators FY07

8,787 Missile FY07
17,494 FY07
128,531 Small Arms FY07
666 Aircraft FY07

2,263 Tracks
12,948 Wheels
(* Includes Reset & Recap)

26,332  FY07
6,606  FY07
17,494  FY07
11,496  FY07
4,036  FY07
11,453  FY07
8,284  FY07
3,733  FY07
16,235  FY07

8,787 FY07
17,494 FY07
128,531 FY07
666 FY07

15,032  FY07
13.3K Short Tons Ammunition Processed for Reissue in SWA
9 Patriot Battalions
68 MLRS

FY07 Projections

As of 19 Oct 06
Future

- Health of the Industrial Base
  - Joint Centers of Excellence
- Increase Efficiency and Partnership
- Increase the Awareness and Synchronization
  - OSD, Congress and the Services
  - Laws, Rules and Regulations
- Totally Integrated Life Cycle Management Commands