



Ground Vehicle Sector Industrial Assessment

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Overview

- Sector Overview
- Tracked Vehicles
- Wheeled Vehicles
- Summary and Observations

Ground Vehicles Sector Overview

- Ground Vehicles are tracked or wheeled
 - Distinctions between the two have blurred as a result of lessons learned in Iraq and Afghanistan.
 - Increased importance accorded to arming and armoring all vehicles to provide occupant protection.
- Drawdown in 90s reduced tracked producers to two
 - GD Land Systems developing the Expeditionary Fighting Vehicle.
 - BAE Land & Armaments completing a few FCS Non-Line-Of-Sight Cannon, and large amount of refurbishment work.
 - BAE and GDLS partnered to develop the FCS Manned Ground Vehicle; which is currently being reevaluated.
 - 2008: BAE bought Armor Holdings; GDLS acquired Axel Tech.
- Wheeled vehicle suppliers benefited from MRAP work
 - Major suppliers are BAE, GDLS, Navistar, Oshkosh, Force Protection
 - A total of \$5.4 billion was obligated in FY07 to achieve the maximum production ramp up possible.
 - \$13.5 to \$16.8 billion was obligated in FY08 and ~\$4.4 in FY09.

Ground Vehicles Sector Overview

- Suppliers benefited from increased demand of past few years.
 - Supplementals doubled funding and overall spending quadrupled from pre-war levels
 - For the most part, suppliers are meeting financial obligations, but those dependant on commercial sector are experiencing financial stress.
- There are many important sub-component suppliers, especially for metal plate, composite armor, axels, and transmissions.
- High demand for wheeled and overhaul and maintenance of tracked vehicles will enable industry to remain profitable.
 - FY09 vehicle R&D is \$19.7B, including supplemental funding.
 - MRAP, M-ATV, and continued FCS and JLTV R&D funding
 - DoD will maintain overhaul and repair spending due to the severe operational service; Estimated cost is \$17B to \$19B annually over next few years as compared to \$2.5B to \$3B prior to war.

Current Environment

Reorienting Capabilities



- Development of new vehicles and technologies

- Focus on Personnel / Vehicle Protection
- Robotics

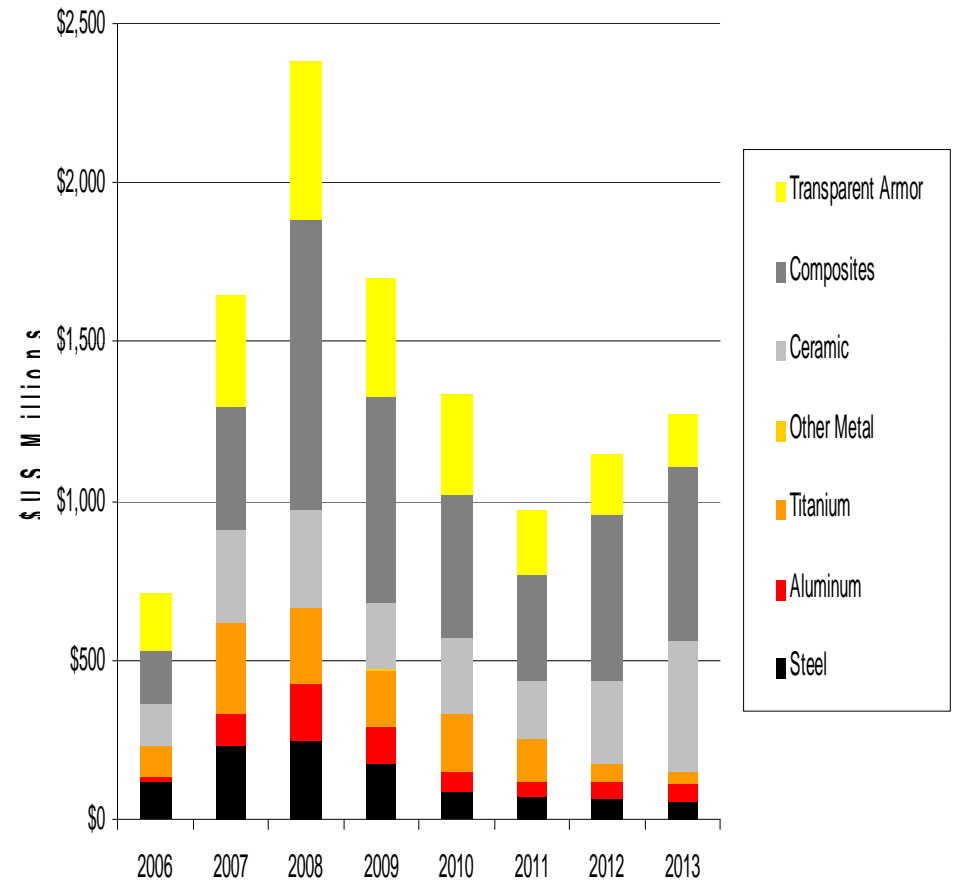
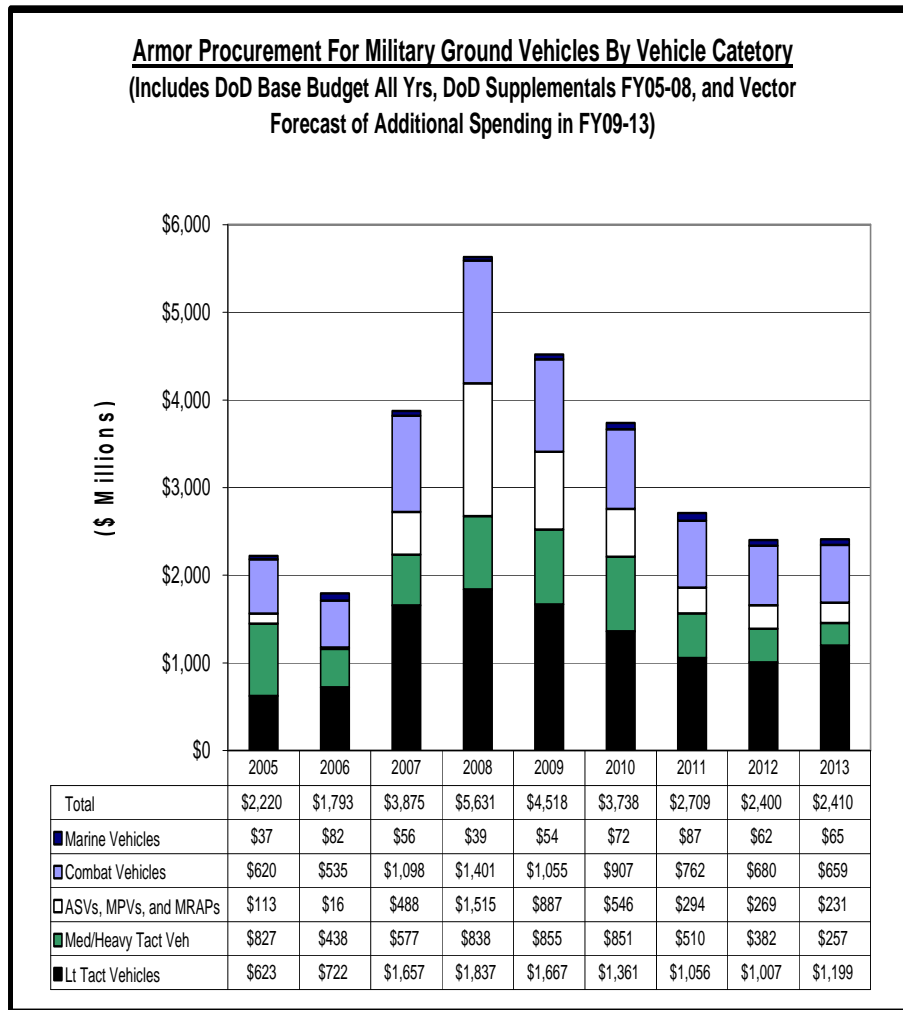
Network communications

- Situational Awareness

- Emphasis on Electronics for Logistics

- Lower cost, easier maintainability
- Lower fuel consumption
- Improved reliability

Changing Vehicle & Material Needs



Courtesy Vector Strategy

Vehicle Categories

Light Tactical and Support Vehicles

HMMWV New Vehicles - All Variants
HMMWV Recap Program
HMMWV Armor and Frag Kits
Joint Light Tactical Vehicle (JLTV)

Medium and Heavy Tactical and Support Vehicles

Light Medium Tactical Vehicles (LMTV)
Family of Medium Tactical Vehicles (FMTV)
Family of Heavy Tactical Vehicles (FHTV)
Medium Tactical Vehicle Replacement (MTVR)
Logistics Vehicle System Replacement (LVSr)
HEMTT Truck (New)
HEMTT-ESP Truck (Recap)
PLS Truck
Heavy Equipment transporter (HET)
M915A3 Line Haul Truck
M916A3 Light Equip Transporter (LET)
Medium and Heavy Truck Armor Kits
Fuel Tanker Armor Kits
Construction Equip Armor Kits

ASVs and Mine Protected Vehicles (MPVs)

Armored Security Vehicles (ASV)
RG-31 Mine Protected Vehicle
Cougar EOD Vehicle
Medium Mine Protected Vehicle (MMPV)
Mine Protected Clearance Vehicle (MPVC) Buffalo
Vehicle Mounted Mine Detector Vehicles (VMMD)
Mine Resistant Ambush Protected (MRAP) Vehicles
Armor and Fragmentation Kits for ASVs and MPVs

Combat Vehicles

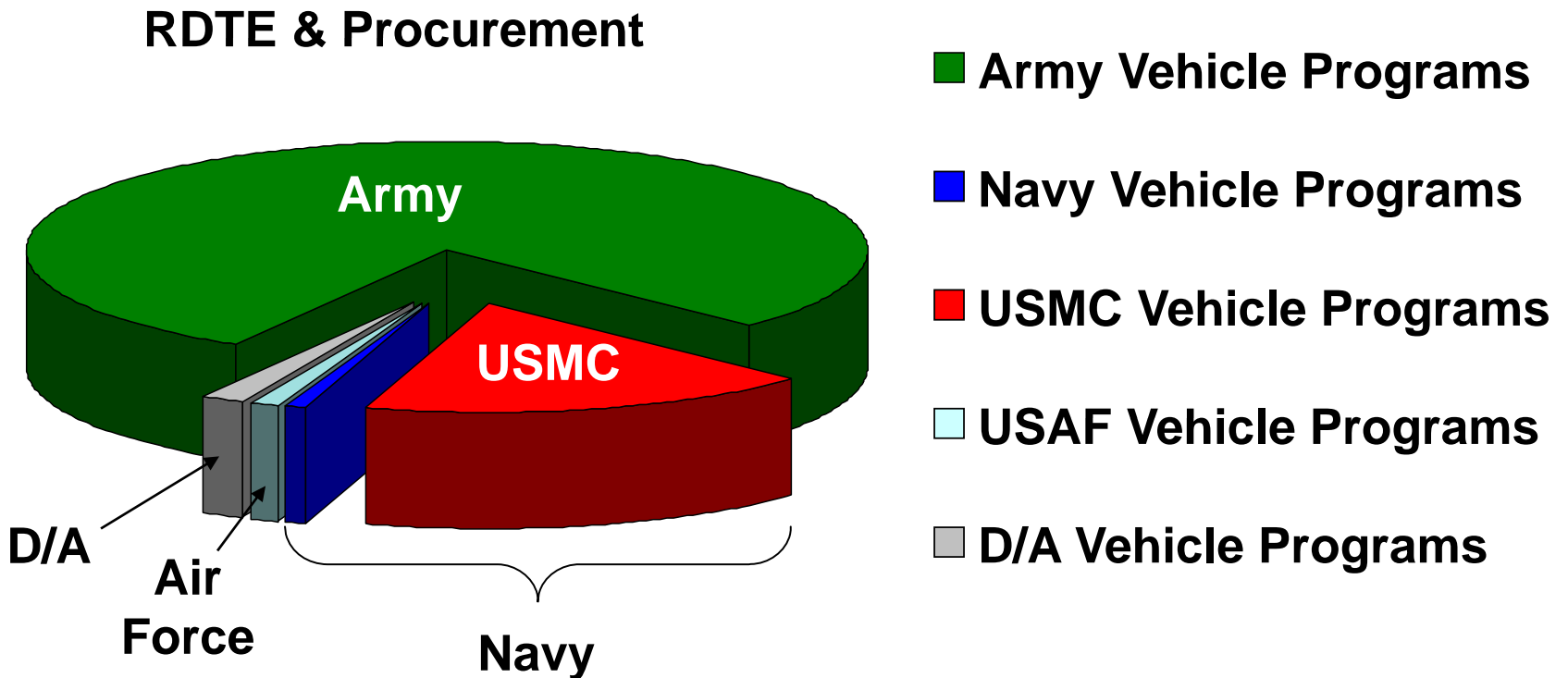
Bradley A2 ODS Recapitalization Program
Bradley A3 Recapitalization Program
Bradley Reactive Tile Kits (BRAT) and IED Armor Kits
A3 and M7 BFIST
Stryker
M113 A2 to A3 Conversions
M113 Armor Upgrades and Kits
HERCULES M88
Abrams Frontal and Turret Armor
Abrams ARAT, TUSK, LAGS
Abrams M1/M1A1 Upgrade Program
Abrams M1A2 System Enhancement Program
FCS Manned Ground Vehicle

Marine Specific Vehicles

Expeditionary Fighting Vehicle (EFV)
Assault Amphibious Vehicle (AAV) EAAK Armor Kits
Marine Personnel Carrier (MPC)
Light Armored Vehicle Upgrades (LAV-A2)
Light Armored Vehicle Replacements (LAV-25)
Internally Transportable Vehicle (ITV)

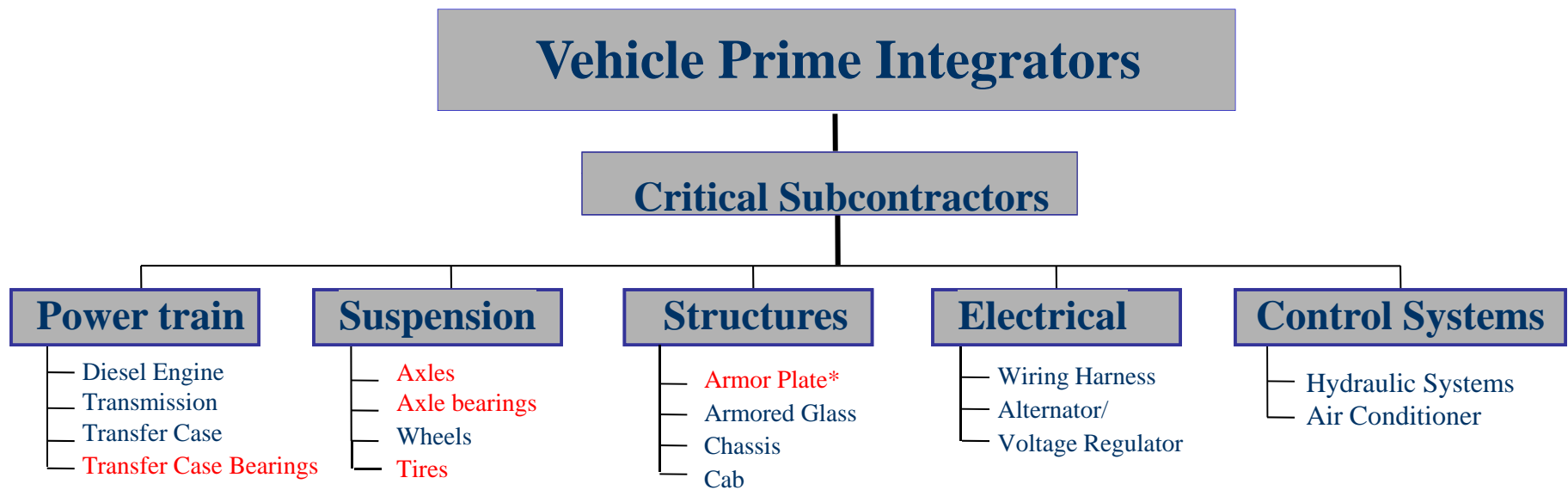
Note: Black text are wheeled &
Blue text are tracked vehicles

Current Environment Vehicle Funding



Army accounts for more than 78% of the total vehicle funding

Ground Vehicle Taxonomy



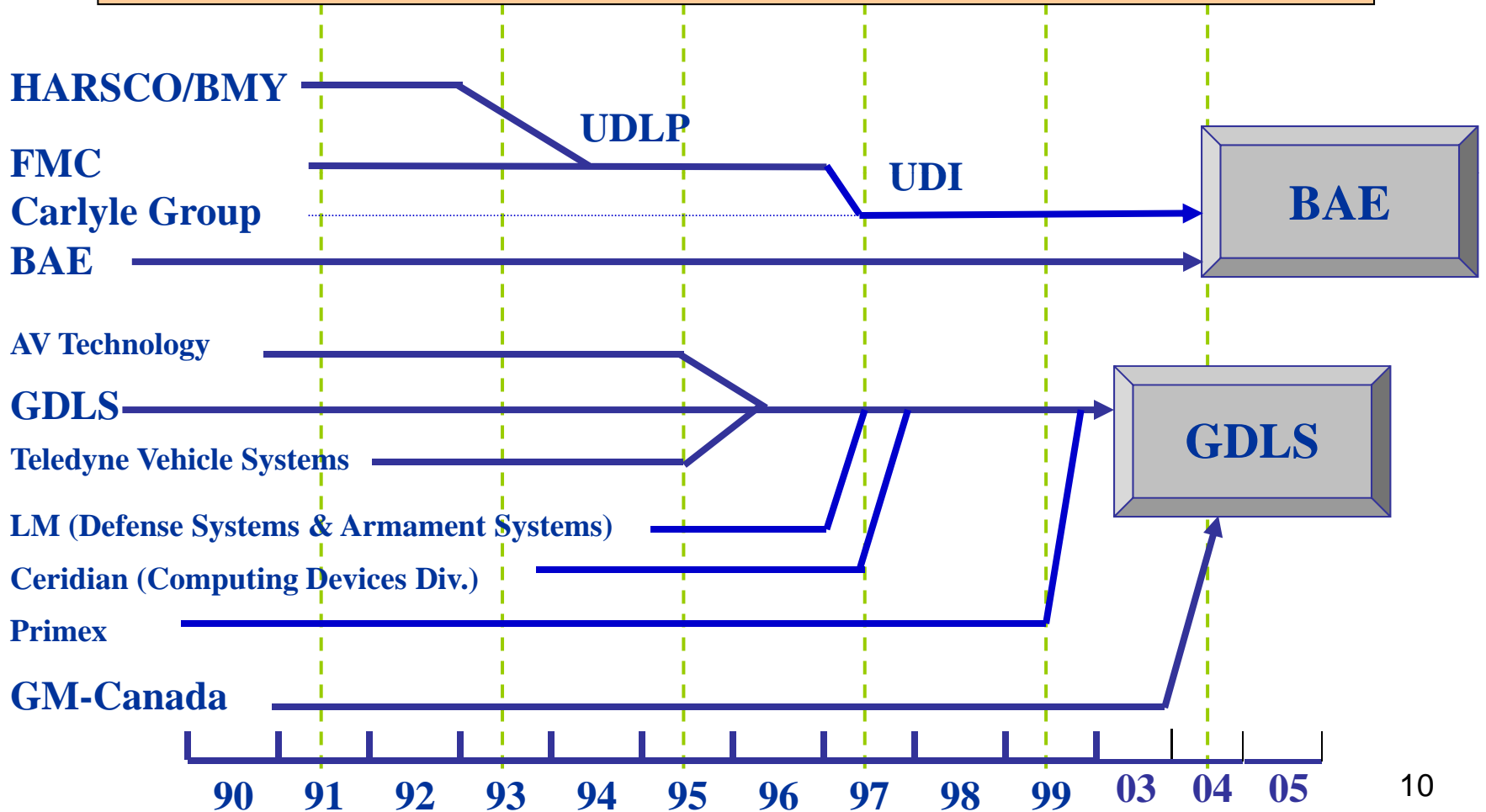
Note: Components in red were potential constraints early in MRAP surge

Armor Plate*

- Steel Plate
- Aluminum Plate
- Glass Fiber
- Para-aramid Fiber
- Polyethylene Fiber

Combat Vehicle Industry Consolidation

This chart displays the results of the company mergers and acquisitions for Prime Ground Combat Systems Contractors - reducing from 4 US Prime Contractors to 2 over the last 15 years.



Source: DCMA and DUSD FY 05

Army Termination of FCS MGCV

- Eliminated Boeing and SAIC's position as Lead Systems Integrators
- Army expected to select specific prime contractors for each vehicle
- Likely contenders are General Dynamics and BAE Systems
- Army likely to end up with a mix of tracked and wheeled platforms
 - Boeing, Lockheed Martin or Northrop Grumman could return to compete for these contracts
 - Teaming with former Joint Light Tactical Vehicle ([JLTV](#)) contenders (Northrop Grumman-Oshkosh and Boeing-Textron Systems were two of the losing bidders) – such a wheeled-tracked split could bring these companies back to the game.



Abrams Tank

- GDLS reset (repairing & upgrade) Abrams for next 50 years.
- Public-private partnership with the Anniston Army Depot,
- Has key role in Heavy Brigade Combat Teams
- Subsystem rebuild and vehicle reassembly at ANAD
- Structural overhaul at GDLS Lima Tank Plant, OH.
- Maintaining Allison Transmission R&D capability
- Electronic obsolescence a continuing challenge
- QDR implications may severely stress GDLS & supply chain, especially at Allison Transmission
- Cost ~ \$700M/year



Stryker

- Led by Infantry Carrier Vehicle + 8 other configurations
- No longer an interim capability; it is warfighting capability
- Is apparent heir apparent to M113 tracked vehicle
- Modernization program underway to improve capabilities
- Has space / weight / power challenge
 - Digitize to increase capability
 - Increase electrical power
 - Improve suspension to support added armor
 - Address obsolescence



M113A



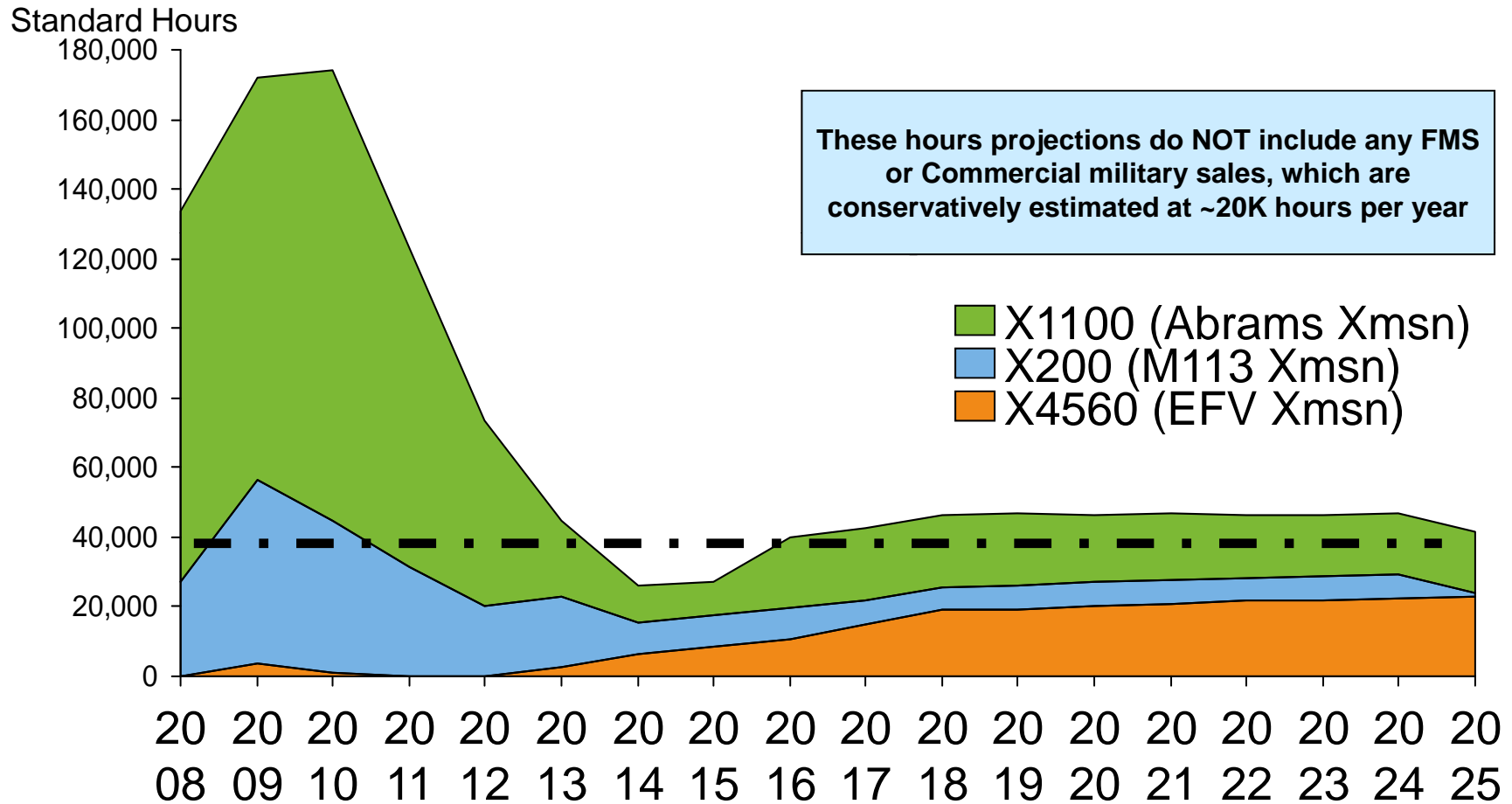
Expeditionary Fighting Vehicle

- EFV program after FY07 Nunn-McCurdy Breach lead decision to extend SDD and delay LRIP till FY 10
- Total quantity reduced from 1,013 to 573
 - FRP reduced from 120 to 55 per year
 - Quantity reduction, production gaps and potential cancellation impacting GDLS and critical subcontractor Allison Transmission



Problem Statement

Allison Transmission Plant 14 Requirements Standard Hours



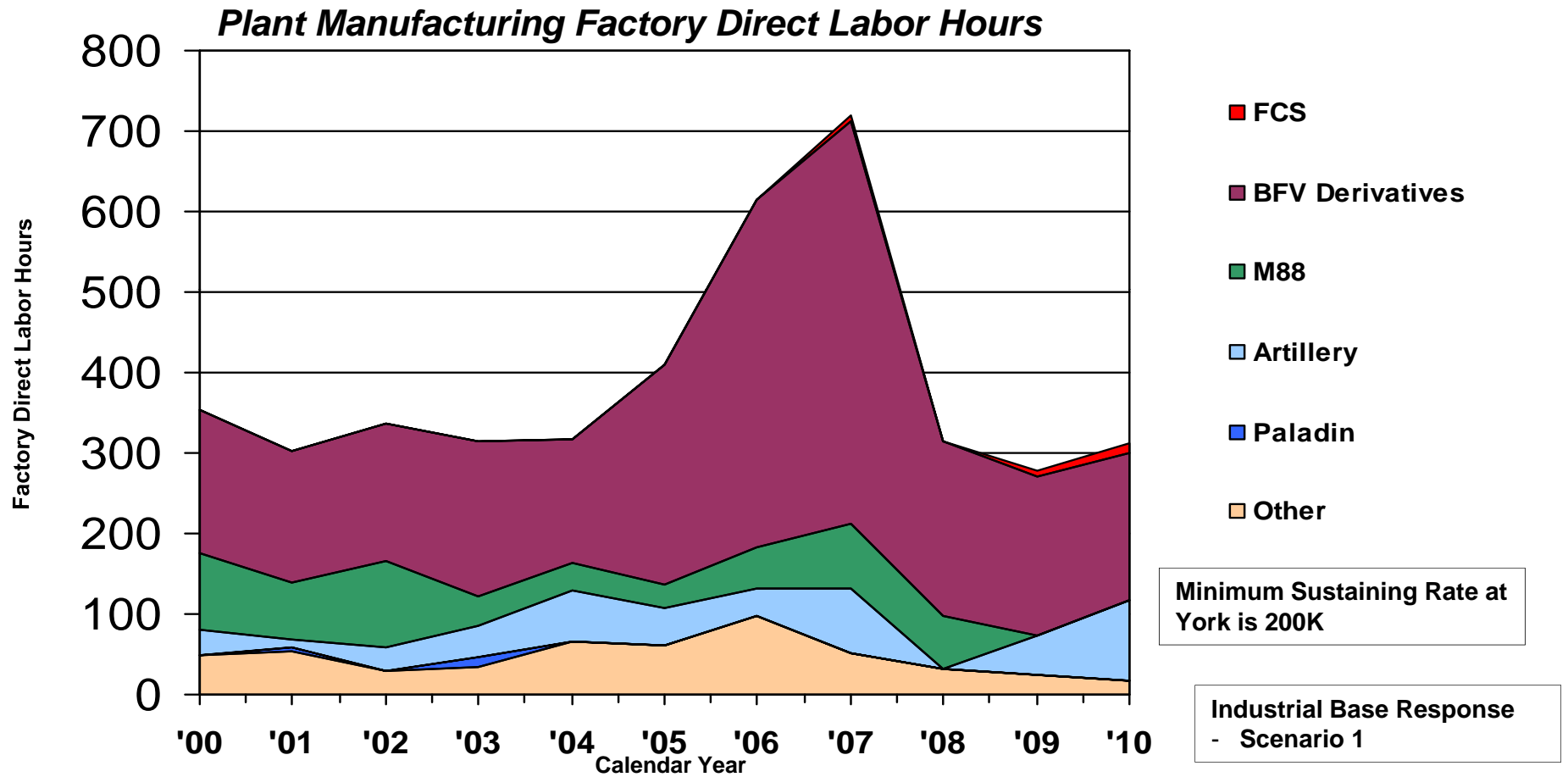
Mission: Develop a plan for long term sustainment of the Heavy Transmission¹⁵ Industrial Base in an environment of declining business

Bradley Fighting Vehicles

- BAE Systems reset (repairing & upgrade) BFVs.
 - FY08 ~\$710M & FY09 ~\$600M in awards
 - 6720 vehicles fielded
- Public-private partnership with the Red River Army Depot,
- Has key role in Heavy Brigade Combat Teams
- Subsystem rebuild at RRAD
- Structural mods at BAE in Fayette County, PA.
- Assembly, integration and testing at BAE York, PA.
- QDR implications may severely stress BAE & supply chain



York Facility Load Profile



Supplemental Funding Through FY2010

Family Medium Tactical Vehicles

- FMTV is 23 variant and 17 models ranging from 2.5 ton to 5 ton payloads.
- BAE current contract ends end FY10.
- FMTV sales in 09 and 10 of \$2B
- BAE produced 50K MILSPEC FMTV.
- 5yr Oshkosh award up to 23K vehicles, trailers, support services and engineering.
- Requirement ~\$1B/yr starting FY11



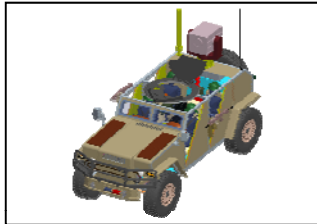
M-ATV for Afghanistan

- Oshkosh teamed with Plasan
- Requirement is 5-10K vehicles by end 2010
- \$5 billion award for
- Production ramping to 1K vehicles/mth by Dec 09 through Mar 10.
- Challenge will be achieving rate production of Oshkosh TAK-4™ axles



Approach - A Family of Vehicles is Needed

Long Range
Surveillance Vehicle
(LRSV)



Combat Tactical
(CTV)/Command &
Control Vehicle (C2)



Utility Vehicle (UV)



Ground Mobility
Vehicle (GMV)



GVW:	<16 K	<22K	<22K	<38K
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MRAP – Not a Solution for Joint “Light” Tactical Mobility

MRAP CAT 1



MRAP CAT II



MRAP CAT III



GVW:	38 K (4 PAX)	52K (6-8 PAX)	84K (8-10PAX)	20
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Joint Light Tactical Vehicle

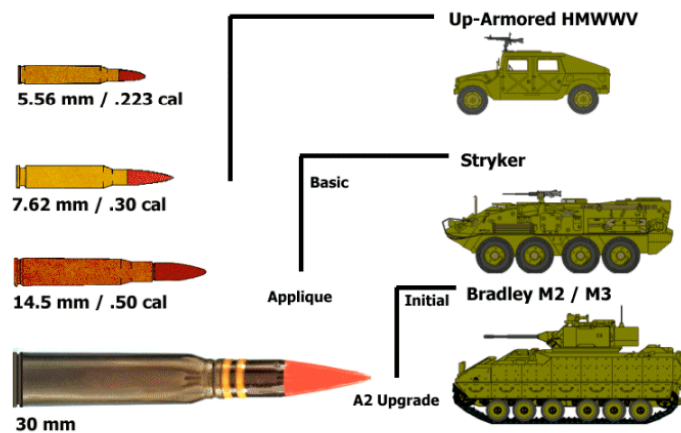
- 3 firms received \$60M to develop:
 - Lockheed Martin (+AH-BAE) = \$35.9M,
 - General Tactical Vehicles (JV GD & AM Gen) = \$45.1M
 - BAE Sys L&A (w/ Navistar) = \$40.5M
 - Possible BAE breach of competition firewall
 - Work due by Jan. 31, 2011
- M-ATV may upstaged JLTV



High Mobility Multi-Purpose Wheeled Vehicle

- The HMMWV was designed for light cargo behind front lines; not designed for asymmetric warfare/low intensity conflicts
- 190K produced since 1985 after 7 year development
- Payload = 5K lbs gross vehicle weight is 12K lbs up from original GVW of 10K lbs
- Army now deploying Up Armored FRAG Kit 7

Comparative Levels of Ballistic Protection



Summary Ground Vehicle Industry Segment

<p>Industry Description</p>	<p>DoD's vehicle prime contractors are profitable and, for the most part, have the capabilities to develop, design, produce and support DoD.</p> <ul style="list-style-type: none"> • Tracked vehicle competition is limited to two suppliers (BAE and GD) • There are multiple sources for wheeled vehicles • New vehicle procurement levels are dropping, but overhaul and modification of existing vehicles will likely remain high, RDT&E funding is stable, with exception of FCS MGV.
<p>Degree of DoD Influence</p>	<p>Supply chain derives from the heavy trucking industry</p> <ul style="list-style-type: none"> • DoD has considerable leverage on military unique aspects of market • Industrial sector vulnerable to DoD funding levels, but also influenced by commercial market conditions
<p>Major Programs</p>	<p>There are six vehicle programs tracked by the Defense Acquisition Executive System (DAES), although MRAP, the largest FY09 vehicle program is not.</p>
<p>Surge Ability</p>	<p>MRAP program demonstrated industry could surge production.</p> <ul style="list-style-type: none"> • DUSD(IP) and DPAS heavily involved
<p>Challenges</p>	<p>Maintaining sufficient and consistent DoD demand to preserve military unique capabilities such as armor material and tracked vehicle transmissions</p>
<p>Key QDR Issue(s)</p>	<ul style="list-style-type: none"> • Delay in FCS MGV program will require extension and upgrade of legacy systems and delay Army implementation of future force concepts

Ground Vehicle Sector Observations

- **Wheeled vehicle primes made up of winners and losers**
 - Leverages the heavy trucking industry
 - Learning curves lost with production gaps
 - Competition likely to drive consolidation and joint ventures
- **Tracked military centric capability difficult to maintain**
 - Anticipate vertical integration and possible merger
 - Partnering blending depot and industry capabilities
- **Industrial base would benefit from AT&L (IP) efforts to:**
 - Provide timely information about overall DoD requirements
 - Better insight into DoD planning translated into long-range major component and material needs