ACQUISITION OF MINE-RESISTANT, AMBUSH-PROTECTED (MRAP) VEHICLES: A CASE STUDY

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Overview

- Introduction and Background
- Demand for MRAPs
- MRAP Description
- MRAP Procurement
- Lessons Learned and Recommendations

MRAP Vehicle Program

- The largest military industrial mobilization since WWII
- The most significant example of urgent government-industry cooperation on a massive scale since WWII
- DoD's #1 acquisition program (per SecDef Gates, May 07)

"The MRAP program was the first major defense procurement program to go from concept to full-scale production in less than a year since World War II." – Secretary of Defense Robert Gates

The Threat

- Improvised Explosive Devices (IEDs)
  - Approximately 70 percent of troop casualties
  - Increasing frequency--"*Beginning in June 2003, IED incidents targeting coalition forces began to escalate from* ***22 per month to over 600 per month*** *in June 2004. In June 2006, these incidents reached more than 2,000 per month. At one point in 2006, coalition forces in Iraq were experiencing almost 100 IEDs per day*" – GAO, 2009
  - Evolving sophistication
    - Explosively-Formed Penetrators (EFPs)
    - Under-vehicle detonation
    - Bigger bombs

Iraq IED Video

Video is courtesy of a combat-disabled US Army "Silent Professional"

Initial Two Prong Approach

- **Avoidance tactics and defeating insurgents' ability to make and detonate IEDs**
  - In October 2003, a small Army unit dedicated itself to studying IED avoidance tactics and defeating insurgents' ability to make and detonate IEDs.
    - Unit elevated the to a joint task force in 2004, became a permanent entity in February 2006.
    - In FY2007, JIEDDO employed hundreds of people and commanded a budget over **$4 billion**.

- **Adding armor to HMMWVs**
  - In the summer of 2003, DoD also began procuring up-armored HMMWVs (identified as the M1114), as well as adding armor kits to existing vehicles.
    - congressional pressure and media exposure spurred a significant ramp-up in production
    - Add-on kits or new, up-armored models
    - Already in production
    - Flat bottoms absorb a great deal of blast force
    - Marginal improvements in survivability over HMMWV, but, at the same time, insurgent attacks increase in
    - frequency and ferocity

What are MRAPs?

- MRAP vehicles:
  - a family of vehicles that incorporate a V-shaped, armored hull that directs blast away from crew
  - High ground clearance dissipates blast intensity
  - Heavily armored
- Not a new Concept
  - South Africa deployed the first major contingent of MRAPs in the 1970s

Early MRAP Use

- U.S. began testing MRAP vehicles in FY 2000
  - A few dozen were in service in Iraq and Afghanistan prior to the MRAP program
  - Viewed as a niche capability for EOD teams, rather than as replacement for the HMMWV
  - Demonstrated superior survivability
- Vehicle Loss Rates Attributable to Mines

Conflict	Loss rate (%)
World War II	23
Korea	56
Vietnam	70
Operation Desert Storm	59
Operation Restore Hope (Somalia)	60

Demand for MRAPs

- Field demand for better-armored vehicles began, as IEDs emerged as a major threats, shortly drive into Baghdad 2003
  - Interest beyond EOD teams, from regular combat forces to replace HMMWVs on certain missions
  - For example, a Military Police Commander issued an urgent request for armored security vehicles in June 2003, to better protect U.S. convoys in Iraq
  - Also, latter that summer 101st Army Airborne Division issued a report citing IED injuries and seeking more vehicle armor

Formal Request

- First formal field request – Urgent Universal Need Statement (UUNS) from Deputy Commanding General, I Marine Expeditionary Force came February 17, 2005
  - Request for 1,169 MRAPs routed to the USMC in-house rapid acquisition process
- MCCDC **stops processing request** in light of Commandant's decision to replace all HMMWVs with up-armored HMMWVs
- Demand continued, and manifested as a Joint Universal Operational Needs Statement (JUONS) in joint-service channels
  - May 2006: Commanding General, Multi-National Force – West issues a Joint Staff Rapid Validation and Resourcing Request for 185 MRAPs
  - July 2006: An additional 1000 MRAPs requested
  - November 2006: First contract signed for MRAP production

Why the 'Delay' in the Requirements Process?

- Nearly two years (20 months) passed from the time of the first formal field request for MRAPs, until validated requirements were obtained
- Speculation on DoD's thinking:
  - Threatened programs of record, e.g. MRAPs would divert funding away from existing development programs such as the Joint Light Tactical Vehicle (JLTV)
  - Enemy constantly adapting faster than MRAPs or other solutions (up armored HMMWVs) could be fielded and updated
  - Incongruent with envisioned light, expeditionary force structure
  - Counter to counter-insurgency strategy
  - Casualty rates not historically high
  - Belief in a short war
  - Would arrive to late to make a difference

MRAP Description

Category I

- Intended for urban combat environments and patrols
- Transports up to 6 personnel
- Curb weight 7 – 15 tons
- Estimated per unit cost range: $300,000 to $550,000*

Category II

- Intended for convoy escort, troop/cargo transport, explosive ordinance disposal and ambulance missions
- Transports up to 10 personnel
- Curb weight 15-25 tons
- Estimated per unit cost range: $540,000 - $644,000*

MRAP Description (cont.)

Category III

- Used primarily for route clearance and explosive ordinance disposal
- Transports up to 13 personnel
- Curb weight 25 tons
- Estimated unit cost: $856,000*
- Only FPI's 6x6 Buffalo was awarded production in this category,
- And, only the USMC acquired Category III MRAPs through the MRAP program

*These estimates are for the base model. Modifications, to include armor upgrades, increased the costs. The accepted estimate is that average cost for MRAPs is approximately $1 million per vehicle.

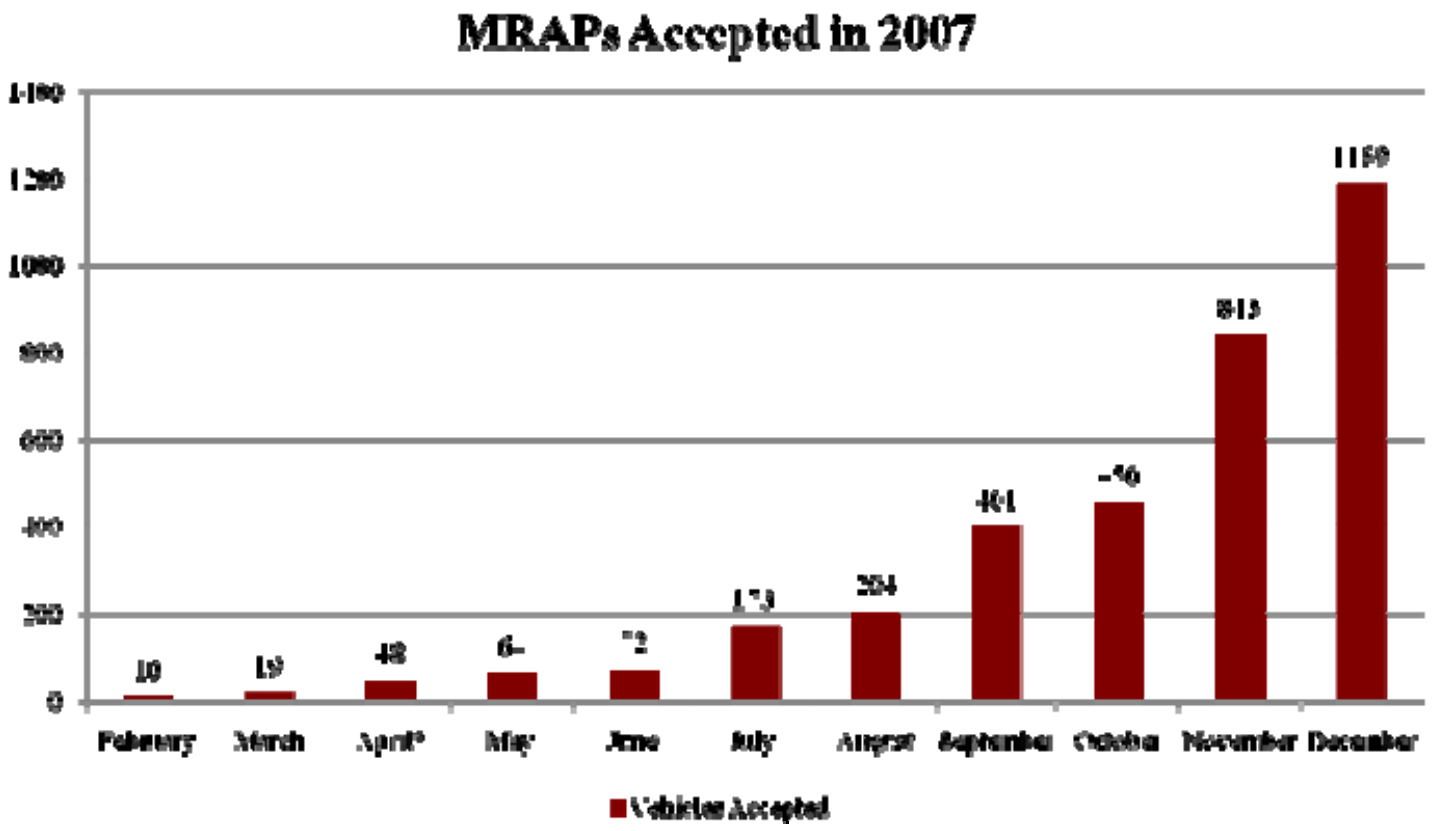
And we're off

- Aug 2006 - RFI to industry
- Initial requirement validated Oct '06 for 1,185
  - Requirements would escalate to over 16,000 MRAPs and 6,600 M-ATVs by Oct '09
- Nov 2006 – RFP released
  - Minimum set of performance standards
- Nov 2006 – Sole Source production contract signed for Cat II and III
  - already in production by Force Protection Industries (FPI)
  - Goal to start procuring vehicles immediately

Industry Responds

- Ten manufacturers responded to the RFP
- The proposals were evaluated based on technical approach and proposed delivery schedule.
- Nine contractors were awarded firm-fixed-price IDIQ contracts
  - Up to 1500 Cat I, and 2600 Cat II MRAPs per year (one year and four option years)
- Also required the nine vendors to supply 2 vehicles in each category (I and II) for survivability and mobility testing.
  - These 36 test vehicles cost $88 million.
- LRIP orders immediately to 5 manufacturers on the basis of risk in their proposals
  - Allowed industry to ramp-up
  - The entire program would essentially run on LRIPs
- Follow-on production orders based on subsequent rounds of testing and production capacity

Program Accelerates Quickly



Other Issues

Funding

- Congress gave the program everything it requested, it even appropriated funds in excess of requests
- Through FY2009, $26.8B in wartime supplementals and reprogramming -- to procure over 16,000 MRAP vehicles
- Supplemental funding had no "color."
  - A component critical was a transfer fund set up by the Office of the Secretary of Defense (OSD)
  - Allowed the Joint Program Office to decide how to color money by type and service.

Priming the Industrial Pump

- DX rating
- Funded manufacturer facility upgrades
- Tire shortage
  - Paid for additional molds for Michelin
  - Certified Goodyear tires
- Steel shortage
  - Dropped import restrictions
  - Qualified more steel makers
  - Increased plant capacity

Other Issues

Testing

- Concurrent testing, production modification, and fielding
  - New orders placed after each round of testing
  - Continuous improvement
- Manufacturer reps on site at Aberdeen
  - Immediate feedback to production and design teams

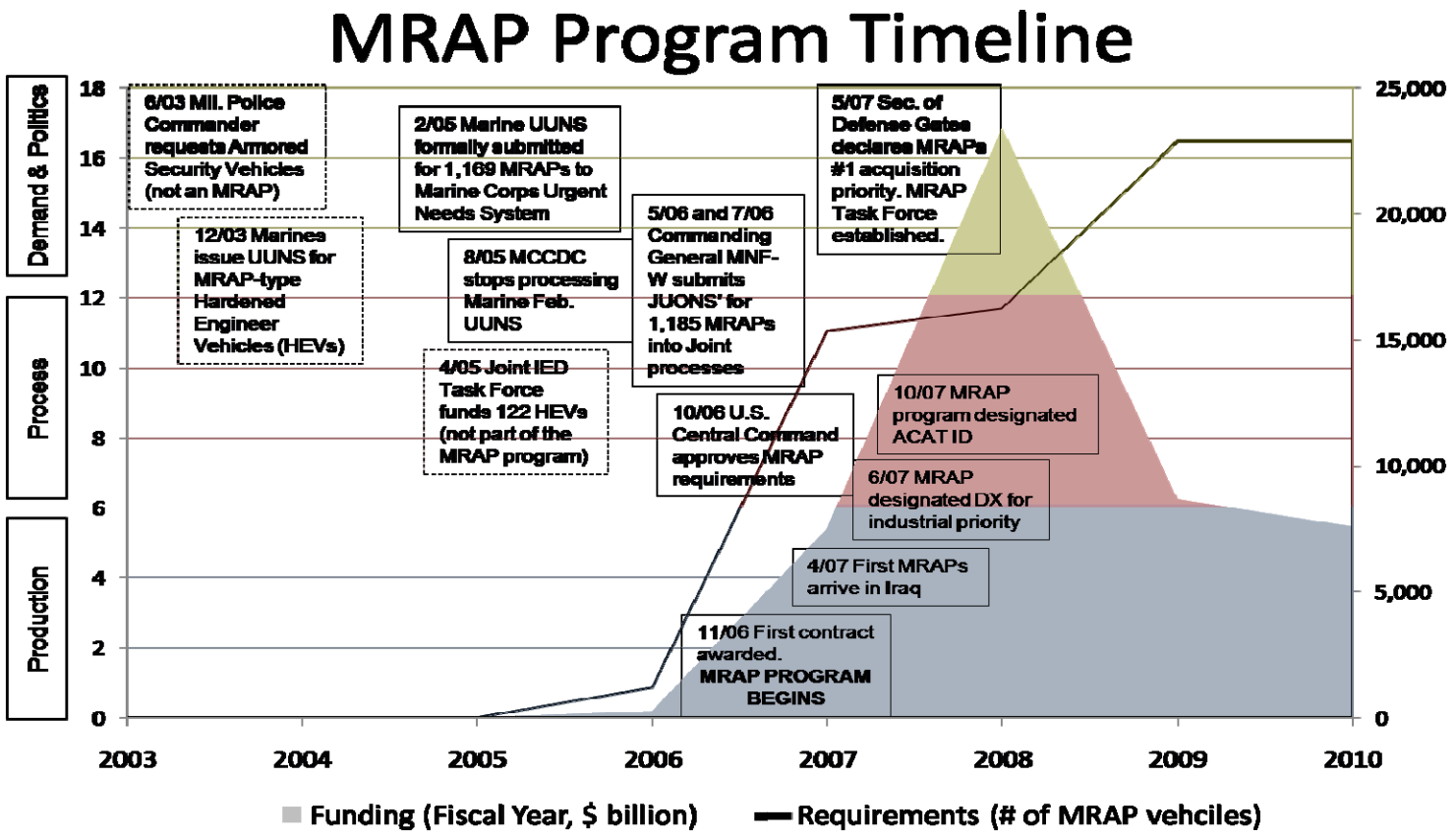
GFE and Transport

- All GFE installed at SPAWAR
- Air-shipped until capacity reached
  - Roughly half of all MRAPs
  - Approximately $160,000 per vehicle
- Surface (Sea) shipments
  - Approximately $20,000
  - Afghanistan MRAPs still air-shipped

Field Support

- With the initial requirement (below 1,700 vehicles), the program planned for contractor logistics support.
- As the requirements dramatically increased, the Army planned to transition to an organic approach
- Currently employing a hybrid strategy
- The program office also required the contractor's field service representatives to be able to maintain the other manufacturers' MRAPs
  - This provided significant flexibility in-theater
- As of November 2009, fleet readiness was 97% in Iraq and 90% in Afghanistan

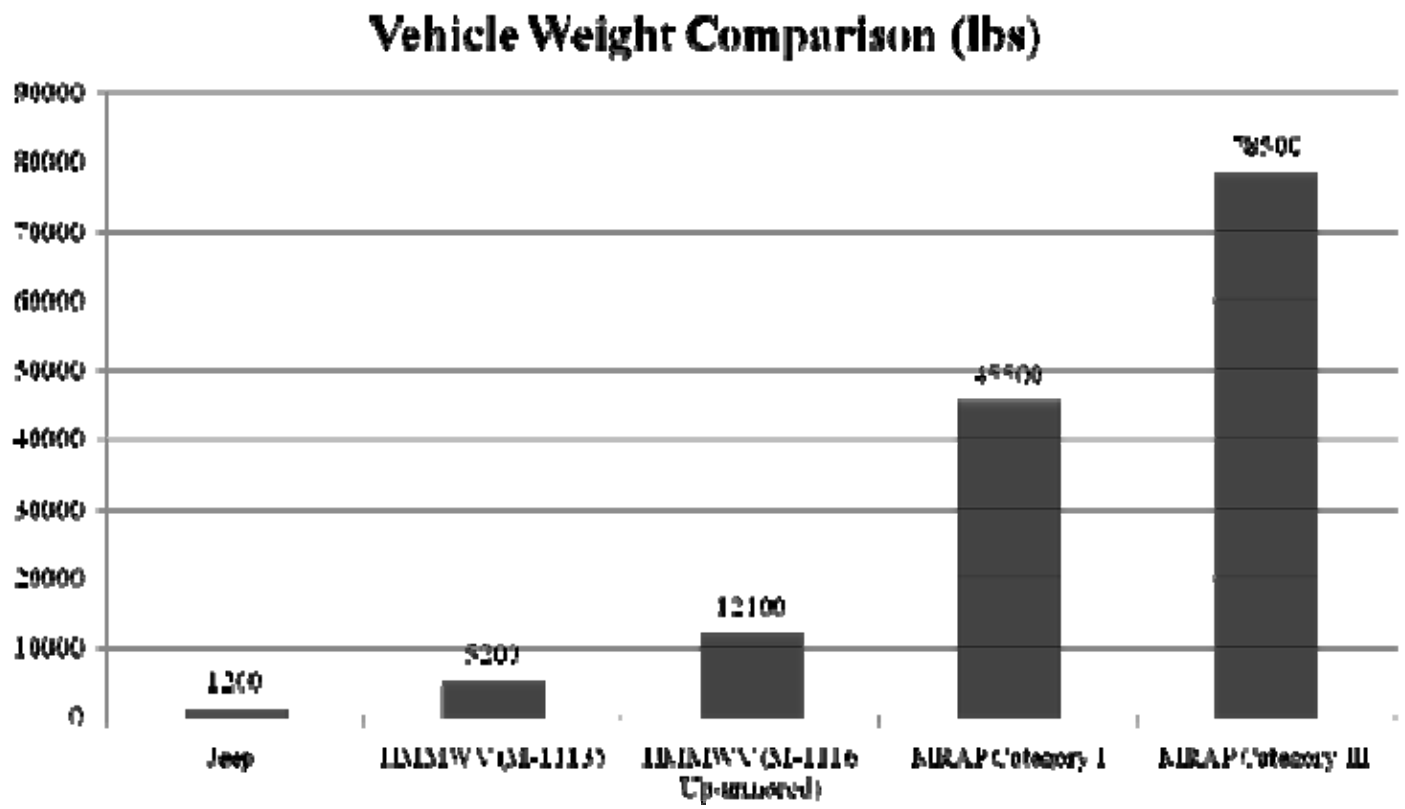
MRAP Program Summary



MRAP Limitations

- Poor maneuverability makes it difficult, sometimes impossible to use in an urban environment
- Poor off-road performance
- Prone to tipping
- 70% of world's bridges can't hold MRAPs
- Too wide for many roads
- High fuel consumption—approximately 3 mpg
- Can only be airlifted by U.S. Air Force's C-17 and C-5, and Russia's AN-124
- Do not fit on the Marine's pre-positioning ships

Not So Expeditionary



The Most Survivable Vehicle

"MRAPs have proven time and time again to save the lives and limbs of soldiers and Marines … and I think they're worth every dime the taxpayers are spending on them" - Secretary of Defense Gates (Scully 2009)

- MRAPs can reduce IED casualties by 80%
  - Commandant of the Marine Corps
- 4 to 5 times safer than up-armored HMMWV
  - Asst. Commandant of the Marine Corps
- Casualty Rates:
  - MRAPs: 6%
  - Abrams tank: 15%
  - Up-armored HMMWV: 22%

Lessons Learned & Recommendations

Leadership

- Champions—enjoyed the unwavering support of the SECDEF and Congress
- MRAP Task Force—all relevant decision-makers met weekly to solve problem in real-time
- Unity of message/purpose—once the decision was made, there was clear agreement by all stakeholders that the goal was to field as many survivable vehicles as possible as quickly as possible.

Recommendations

- Assign senior-level champions to ensure that the program keeps moving through the acquisition process.
- Constantly reinforce the priorities of the project and expectations

Lessons Learned & Recommendations

Requirements and Acquisition Processes

- Rapid acquisitions need not be linear
  - Tailored acquisition approach
- Inadequacy of current acquisition system for rapid acquisitions
  - Ad hoc organizations
  - Must work within the deliberate acquisition system
- Supplemental Funding

Recommendations

- Allow flexibility in timing of paperwork and process
- Create a separate rapid acquisitions agency

Lessons Learned & Recommendations

Production

- Priming the industrial base
  - Industry leaned forward buying material at risk, in advance of orders at their own
  - DoD awarded LRIP contracts to all low-risk manufacturers even before testing was underway
  - DoD provided funding to upgrade facilities and equipment
- Securing scarce resources—steel and tires were the limiting factor
- Used existing technology, with continuous refinement and competition
- Manufacturers embedded at test center
- Open to outside solutions—minimum performance requirements were set
- Willingness to take reasonable risks

Recommendation

- Encourage the appropriate level of risk tolerance
- Embed manufacturer representatives at test facilities

Conclusion

- The level of effort and flexibility of everyone involved – from the program office, to the manufacturers, to SPAWAR – made the rapid fielding of MRAPs possible and **absolutely saved lives**
- The program has also shown what is possible in scale and scope when enormous political will and (nearly unlimited) funding are brought to bear on the existing military procurement system
- Succeeded **despite** having to work within the existing acquisition system