



Project Manager Joint Combat Support Systems

Develop and Acquire Joint Combat Support Systems for Expeditionary Forces

Joint Light Tactical Vehicles

**NDIA
TWV Conference**

7-8 Feb 2011

COL John S. Myers

Project Manager

Joint Combat Support Systems



Agenda

- **Program Overview**

- COL John S. Myers, *Project Manager Joint Combat Support Systems*

- **ARMY Perspective**

- Mr. Mark McCoy, *Product Manager Joint Light Tactical Vehicles (USA)*

- **USMC Perspective**

- LtCol Casey C. Travers, *Program Manager Joint Light Tactical Vehicles (USMC)*

- **Australian Defence Force Perspective**

- LTCOL Robin Petersen, *Australian Cooperative Program Personnel*



Program Overview

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TD Phase Industry Prototypes



Who's Who in JLTV

Program Governance

- OSD / ARMY / NAVY
- Program Certification & Milestone Decisions

Material Development

- PEO CS & CSS / PM JCSS / PM JLTV
- Program Management
- Milestone Documentation Development

Requirements Development

- SCoE / MCCDC
- CDD Development & Staffing for Approval

TD Phase Industry

- BAE Systems – Ground Systems
- Lockheed Martin Owego
- General Tactical Vehicles

Science & Technology

- TARDEC / ONR
- Technology Development
- Trade Studies to Support Requirements Development

TD Phase International Participants

- Countries: Australia, Israel, UK & Canada
 - PA: Australia
 - Established WGs: Canada, UK & Israel





Strategic Focus

Requirements:

- Transportability
- KE & Blast Protection
- Maneuverability = Mobility
- Sustainability – Availability and ease of maintenance
- Reliability
- Fuel Efficiency
- Net Ready
- Payload
- Affordability
- Commonality

JLTV Attributes:

- CH47/CH53/C130 (air)
MPF / Amphib Compatible (sea)
- Scalable to meet threat using A-/B-kit approach
- With B-kit armor & payload JLTV achieves HMMWV off-road mobility
- 95% A_o (Projected) / Avg time to repair = 0.5 hrs; Max time to repair = 2.5 hrs
- Cat A/C = 4,500 MMBOMF
- JLTV @ GVW increases FE 25% over HMMWV @15,200 (OMS/MP & at Idle)
- Integrated Net-Ready Vehicle Architecture / w/ 20KW On-board & 10KW Export Power
- JLTV=3500–5100# @ GVW / HMMWV = ~0
- Base vehicle cost ~\$305-340k (TD est)
- 90%+ within payload category; 70%+ across payload categories



JLTV Modernization Features

JLTV to provide scalable C4I and adaptable levels of protected mobility to Fire Teams and Combat Support teams.

Adaptable:

- Varying levels of protection in response to mission threat
- Expeditionary vehicle family
- Over full range of operations / conditions

Network-Ready / Interoperable

- Space, weight, power claims for C4I systems

Resilient:

- Designed to enter harms way & return forces safely
- Adapts light fleet to the IED / Counter Insurgency paradigm
- Retains Major Combat Operations capability

Increases maneuver capacity:

- Provides protected mobility on the modern battlefield

Protected Mobility:

- Exceeds current TWV payload & tactical mobility
- Increase protection (especially EFP & IED) through scalable armor
- Returns payload currently traded for armor

Increased commonality:

- JLTV to be designed for commonality beyond major components, to include repair parts, tools, training, system design, maintenance procedures and sources of supply





JLTV Modernization

Automotive/Electrical

- Automatic Transmission
- Advanced Powertrain Control
- Semi Active Suspension
- Adjustable Ride Height
- Anti-lock Brakes
- Traction Control
- Electronic Stability Control
- Substantial On Board and Exportable Power
- Smart Power Distribution and Control
- J1939 Data Bus
- HVAC
- CTIS
- Matched Trailer
- Shelter Compatible

Logistics

- Condition Based Maintenance
- On Board Diagnostics
- Interactive Electronic Technical Manuals
- Line Replaceable Unit System and Components
- Quick Disconnects and Engine Mounting Rails



C4I / Integration

- Scalable Open Architecture
- Integrated Computing and Displays
- On Board Hosting of Common Applications
- Centralized Radio Control and Operation
- Gigabit Ethernet Network
- Multiple Security Enclaves
- Integrated Cross-Domain Solution
- Networked Intercom
- Hardware Sized to Support Future Growth
- VICTORY Architecture Compatible
- Legacy and Future C4I Supportable



Survivability

- Kitted Scalable Armor
- Integrated Blast Seats and Restraints
- RPG and EFP defeat kits
- Current LTV Weapon System and RWS Compatible
- Gunner Protection
- LVOSS
- AFES
- CREW Compatible
- Networked Situational Awareness





State of the Program

- **TD testing of 3 manufacturers underway at APG, YTC, Australia**
 - Tech Demonstrators generally meeting requirements with exceptions
 - Delays force eliminating some performance, delaying RAM tests
 - Current force protection requirements appear achievable
- **Current schedule - JROC approved CDD in Jun 11, MS B in Sep 11**
 - RFP release 4Q FY11
 - CDD JROC approved 1Q FY12
 - MS B 2Q FY12
 - EMD Contract Award 2Q FY12
- **Bottom Line:**
 - Intent of TD is being achieved – Informing the Requirement
 - Adequately informing the CDD requires schedule adjustment
- **The Draft Performance Specification is posted at:**
 - http://contracting.tacom.army.mil/majorsys/jltv_emd/jltv_emd.htm

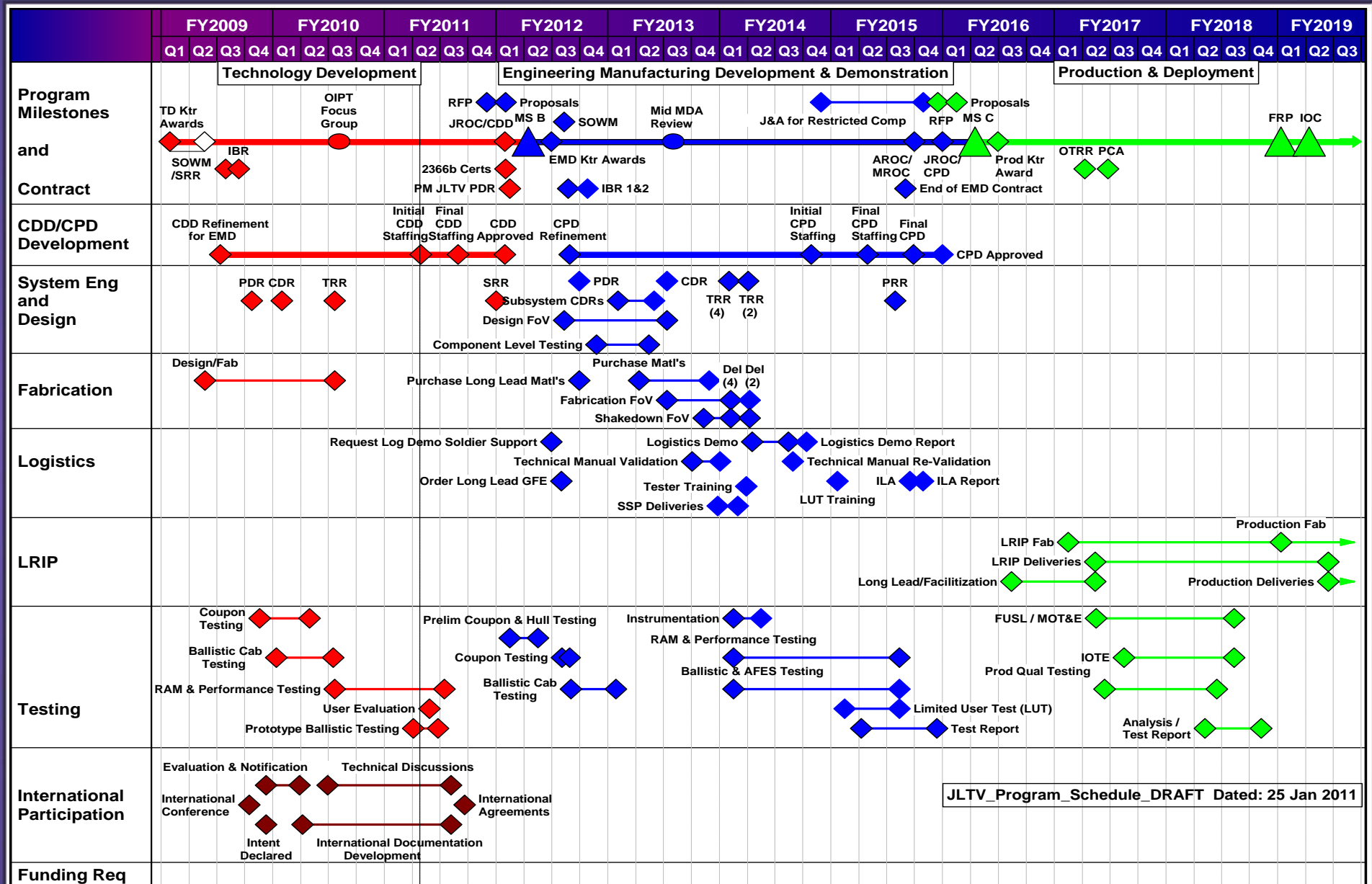


Life-Cycle Acquisition Approach

- Tech Development Phase
 - Full and open competition for 3 Cost Type contracts
 - Prototypes from each Payload Category (including Trailers)
 - Designs for the entire FoV
 - Developmental Test, limited Operational Test, Limited Live Fire & RAM miles
- Engineering, Manufacturing & Development Phase (Notional)
 - Full and open competition for EMD
 - Competitive source selection and selection of two offerors.
 - Selection approach will evaluate written proposal, ballistic hull(s) and coupons.
 - Integration of mature technologies of Technology Readiness Level (TRL) 6 or greater.
 - Contract type to be determined
 - Vehicles will be designed with an open architecture to integrate future technologies
 - Projected duration from MS-B to MS-C is 48 months
 - Acquire a competitive TDP
 - Focused incentives (Reliability Growth, Maintenance Man-hour Reduction, Fuel Efficiency, Life Cycle O&S Reduction, Accelerated Deliveries)
- Production Phase (Notional)
 - Restricted competition (EMD Contractors only), down select to one contractor
 - Fixed Priced type contract for LRIP and FRP with intent to compete as often as practical based on business case



JLTV Program Schedule (Notional)



JLTV_Program_Schedule_DRAFT Dated: 25 Jan 2011



ARMY Perspective

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TD Phase Industry Prototypes



State of JLTV: Industry Performance

- **Weight** : Continues to be a leading challenge – TD vehicles were several hundred to 1000 lbs overweight. KP reviews have alleviated some of this overrun with requirement changes – we have further to go. We expect further materiel design weight reductions in EMD but not a miracle. Need to arrive at a GVW that has 500-1000 lbs of Margin against GVWR.
- **Payload Mass** : We have seen a tendency of KTRs to reduce payload capacity (weight) to make GVW req'ts. Payload is a KPP with the goal of restoring original HMMWV payloads of 3500-5100 lbs. The challenge here is closely related to the weight risk above.
- **Transportability** : Challenge is two-fold; weight and external size/shape. Weight is mainly for helicopter external lift (CH-47F) and covered in Weight & Payload Risks. Size/Shape is mainly for C-130 internal transport MPF ship transport. TD designs have not been tested yet, but analyses shows we are very close to max envelopes and break-over angles.
- **Payload Volume** : Weight is driving the absolute minimum protected cab size which is squeezing space for internal stowage. Weight is also driving overall vehicle dimensions to minimum which is squeezing external stowage. User Evaluation and test will help us determine if TD vehicles are acceptable – general consensus is we are marginal at present.
- **Force Protection** : Armor drives weight more than anything else. Less protection is a simple answer. Protection levels are a KPP for KE side / under IED. They are unlikely to lessen and, in fact, more likely to increase over time.
- **RAM** : Early Reliability results from test have only 1 of the 3 KTRs coming close to Reliability growth curve. LCCE and Availability KPP are heavily weighted with making Reliability.
- **Mobility**: Test results show vehicles not meeting RCI reqt (Original values based upon HMMWV. Number of factors effecting performance, ground clearance, tire characteristics and weight primary issues). Requirement being evaluated, could potentially change slightly.



PD Changes at KP5

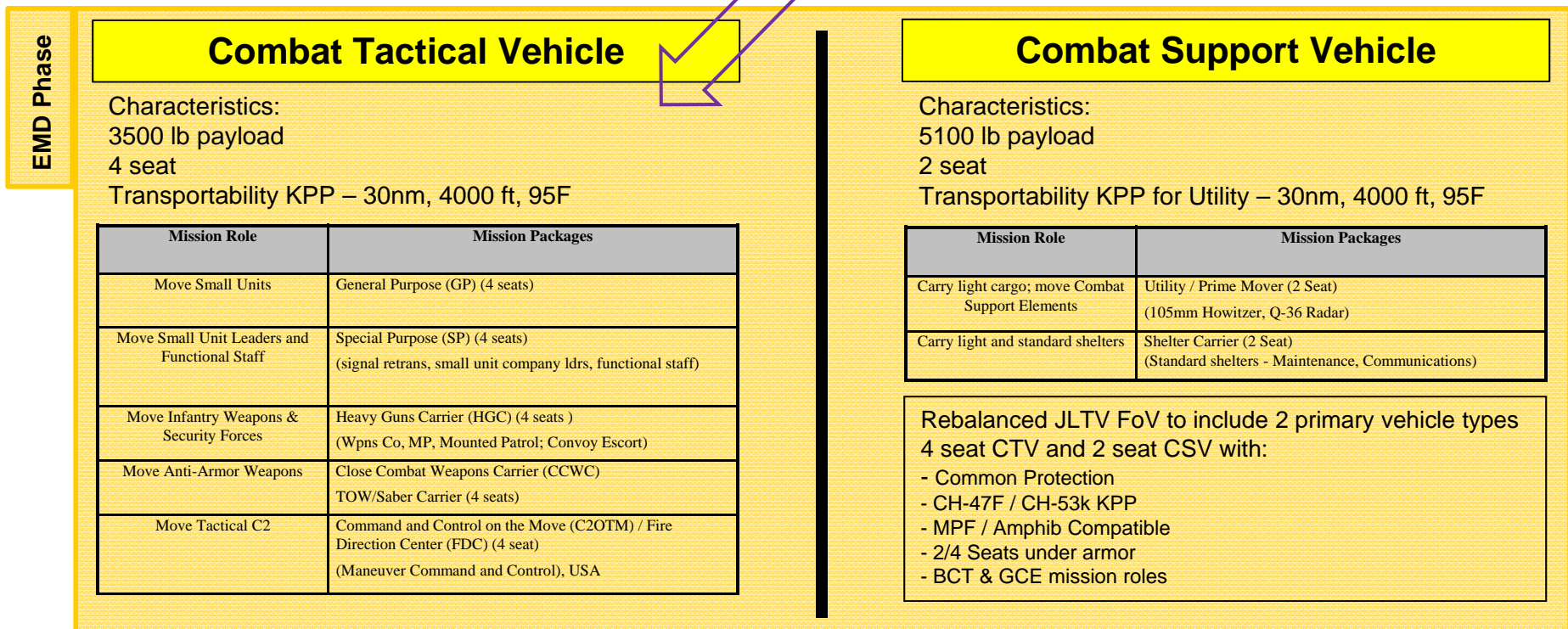
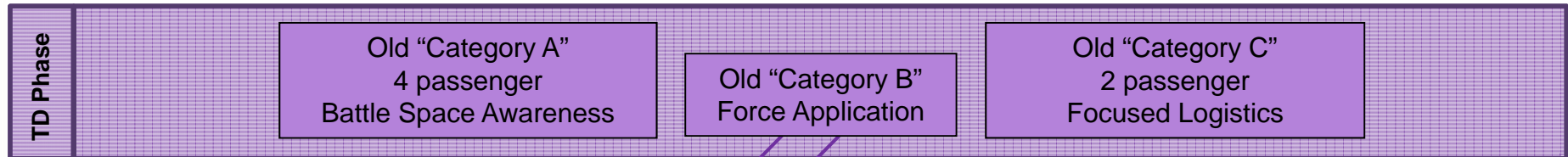
BLUE VALUES HAVE BEEN CHANGED IN THE PD

	JLTV draft PD	Changes and Operational Impact
Protection	Classified (Annex)	Army – equivalent to MATV(T) USMC – Maintaining JLTV
Mobility	Soft Soil (25/27 RCI); & 30% sand slope	Changed to testable value equaling HMMWV off-road mobility
Survivability	Roof to support 150% GVW.	Rigid survivable cab, improve survival in blasts and rollovers
Transportability	CH-53E, CH-47F, Amphibs	Changed to <u>15,629 lbs transport weight</u> due to CH-47F profile
Payload	4 pax and 3,500 lbs 2 pax and 5,100 lbs	Eliminated the 6 passenger, 4500 lbs payload requirement.
Sustainability	95% A _o ; A _m 80%	Exceeds predecessor (HMMWV), saves manpower.
Net Ready	Net-Ready, Integrated	Support critical network connectivity / Tiered C4ISR based on mission roles
Training	Realistic training & simulators	Support training through existing schoolhouses, systems and simulators.
Reliability	4,500 MMBOMF	Changed to common across FOV. 95% probability of completing the missions in the OMS/MP
Fuel Efficiency	Moving: 10 payload-ton-mpg; Stationary: 1.6 gal/hr	Meets Increment II threshold. 1.6gal/hr is a 20% improvement over static HMMWV.



JLTV Family of Vehicles (FoV) (Post KP5)

Two JLTV Variants – Multiple Mission Packages



- 6 passenger chassis eliminated to reduce risk and cost
- Ambulance deferred to future Increment II; 100% solution too heavy, trades deemed unpalatable
- Army/USMC Common Base Protection – Increase FP through B-kit (Army – MATV(T); USMC JLTV(T))



Program Changes/Lessons Learned

- **Information from the TD has changed the scope of requirements**

- Passenger protection impacted in a vehicle that is R/W lift capable
- 4 passenger designs can meet combat, log and C2 functions, but not med-evac
- Increment II fuel efficiency goals are achievable in Increment I
- Common designs support modular mission packages and a single FoV reliability value for two chassis: CTV (Cbt Tactical Vehicle) and CSV (Cbt Support Vehicle)

- **The program is not carrying a TD solution into EMD.**

- The program today is **significantly** different than the program which started TD resulting in a migration from Category B to Category A. The program learned through TD that initial categories and sub-configurations are not properly aligned requiring design effort in EMD.

- **Information from OEF/OIF is being accounted for in the CDD**

- Mission profiles updated to reflect the more severe terrain and MOUT conditions
- Army decision to increase FP requirement to MATV threshold
- USMC focused on mobility, maintaining current JLTV FP threshold

- **Weight , volume and cost continue to challenge the program**

- Delivered vehicles are 10% above predicted weights as TARDEC cautioned
- Limited space to accommodate mission essential equipment and payload
- Updates eliminating, reducing or deferring non-essential capabilities to reduce weight and cost



USMC Perspective

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TD Phase Industry Prototypes



USMC Strategy

- All information and quantities are Pre-Decisional
- Procurement quantity is planned for 5500 vehicles
 - ✓ 4650 Combat Tactical Vehicles (CTV)
 - ✓ 850 Combat Support Vehicles (CSV)
 - ✓ Trailer quantity is TBD
 - ✓ B-Kit armor procured at XX %
- Subset of same mission role variants as Army
 - ✓ No BCOTM
- USMC priorities
 - ✓ Reducing weight of vehicles
 - Mobility contributes to protection level
 - “Lightening the MAGTF”
 - ✓ Reducing cost of the vehicles
 - Need to consider both procurement and sustainment



USMC Concerns

- Increase in Army force protection requirement
 - ✓ Likely increases vehicle weight and cost while reducing mobility and transportability
 - ✓ Could result in another vehicle class (TBD)
- USMC Tactical Wheeled Vehicle Strategy
 - ✓ New technologies that may impact JLTV schedule and strategy
 - ✓ SBC, Capsule/HMWWV Recap, etc.



US Navy Participation

- **All information and quantities are Pre-Decisional**
- **Navy has expressed desire to participate in the program**
 - ✓ No unique vehicle configurations/requirements are anticipated
 - ✓ Approx. 400-500 Combat Tactical Vehicles (CTV)
 - ✓ Approx. 150-200 Combat Support Vehicles (CSV)
 - ✓ Trailer quantity/strategy is TBD
- **Could join program as a separate partner or combined DoN effort with Marine Corps**
 - ✓ In discussions



Australian Perspective

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TD Phase Industry Prototypes



Australian Intent

- **All information and quantities are Pre-Decisional**
- **Procurement quantity is planned for 1300 right hand operation vehicles**
 - 850 General Purpose
 - 50 Command and Control on the Move
 - 400 Utility
 - 1288 trailers
- **Australian specific requirements for JLTVs configured for right hand operation are contained in Draft EMD Purchase Description v2.6 Annex L**
 - Mainly relate to Australian Design Rule (ADR) compliance
 - ADR website:

http://www.infrastructure.gov.au/roads/motor/design/adr_online.aspx



Australian Industry Capability Program

- **Drive and enhance long standing partnerships**
- **Establishes an agreement called an Australian Industry Capability (AIC) Deed**
- **Global Supply Chain (GSC) Program**
 - Assists entry by Australian defence industry into GSC of multinational primes
 - Actively facilitate opportunities for Australian industry to compete in the primes' GSC and that of their major suppliers
- **Maximize Australian industry participation, on a best value for money basis**
- **Australia desires to negotiate and execute AIC and GCS deeds directly with successful EMD offerors**
- **Industry is encouraged to learn about Australia's AIC and GSC programs**



Further Information

- **AIC Program web site:**

<http://www.defence.gov.au/dmo/id/aic/>



BACK UPS

TD Phase Industry Prototypes



JLTV Hardware / Government

BAE SYSTEMS

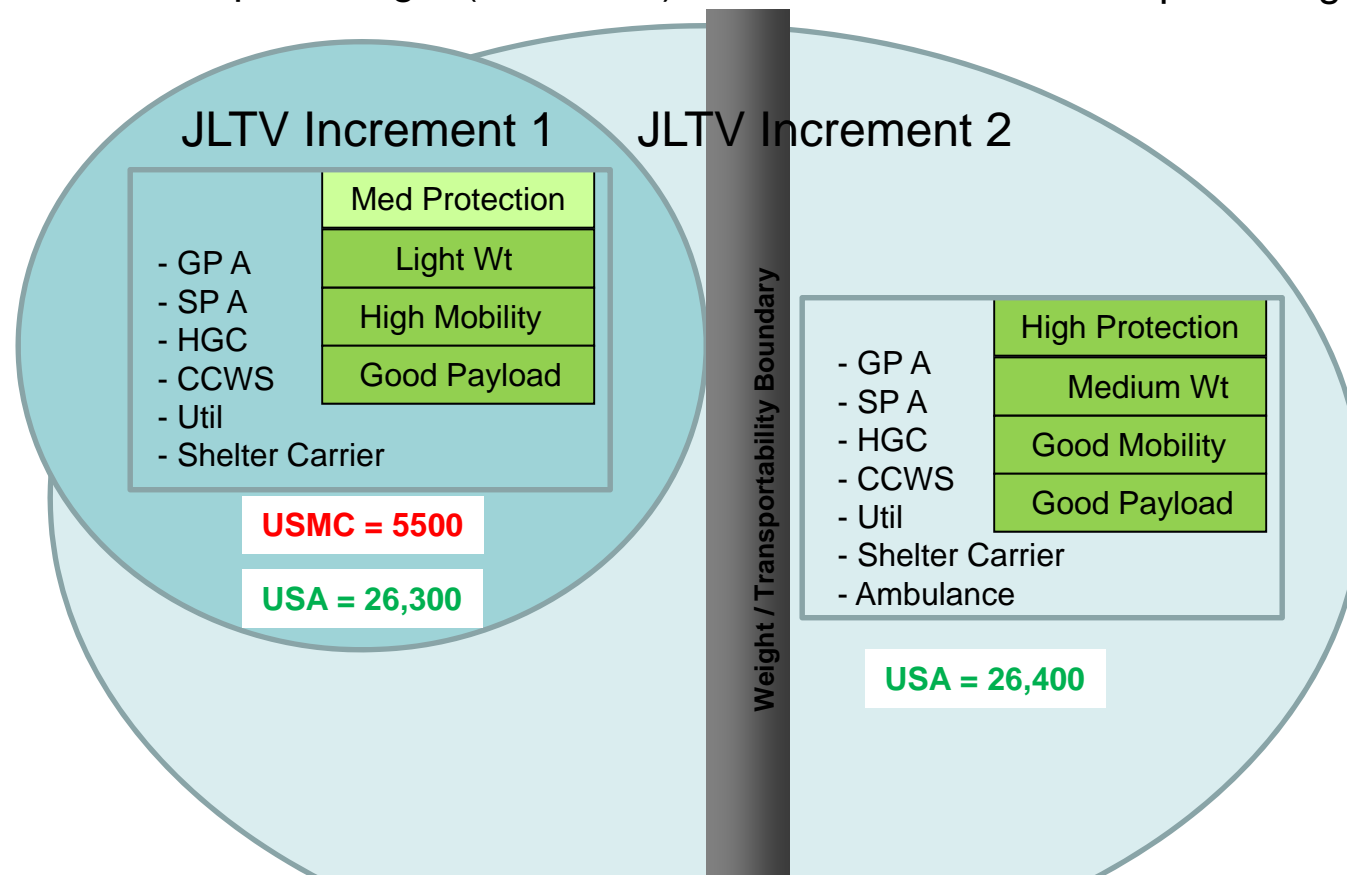




Proposed Army JLTV Scope *(If Heavier Variants Are Required)*

Ch-47 F Transport Weight (15,639lbs)

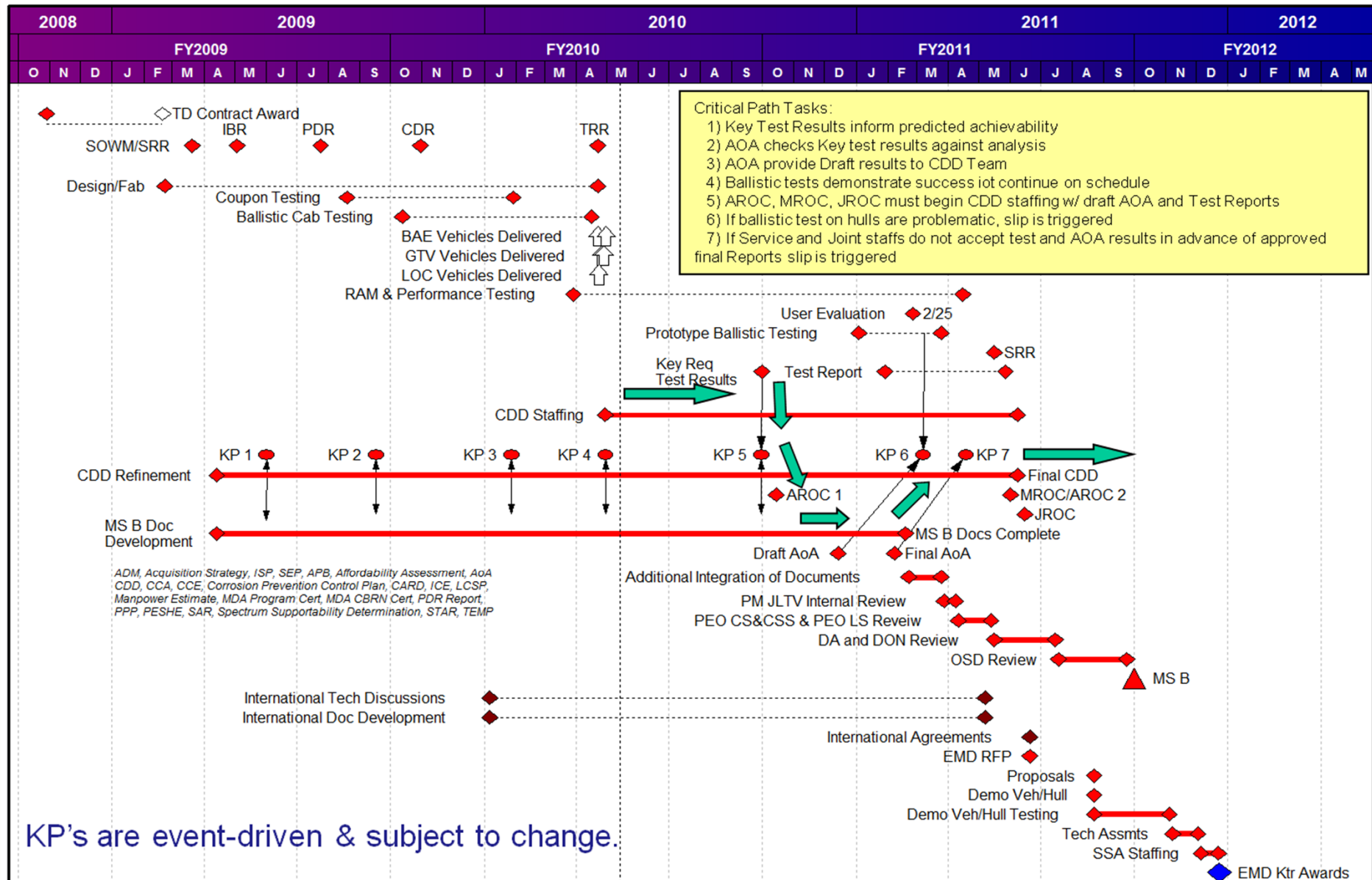
C-130/C-17 Transport Weight (20,000+ lbs)



**CDD will keep focus on TD Center Mass (Increment 1)
If requirements grow, PM needs more scope (resources) and more time
(Increment 2)**



TD Critical Path to EMD Award





EMD Phase System Description

Mission Statement:

The JLTV is a joint service and international program which consists of a family of vehicles with companion trailers, capable of performing multiple mission roles that will be designed to provide protected, sustained, networked mobility for personnel and payloads across the full range of military operations (traditional to irregular).

Characteristics / Description:

•2 Payload categories (A & C).

A – 5 Sub-configurations; Payload 3500 pounds

C – 1 Sub-configurations; Payload 5100 pounds

•Protection: Scalable armor to provide mission flexibility while protecting the force.

•Networking: Connectivity for improved Battlespace Awareness and responsive, well-integrated Command and Control for embarked forces.

Capability / Improvements:

•Transportability: Transportable by a range of lift assets, including rotary wing aircraft, to support operations across the Range of Military Operations.

•Mobility: Maneuverability to enable operations across the spectrum of terrain, including urban areas.

•Protection: Provide scalable C4I and adaptable levels of protected mobility to Fire Teams and Combat Support Teams.
Pending resolution of whether survivability requirements could be changing.

•Sustainability: Reliable, maintainable, maximum commonality across mission role variants, onboard and exportable power, and reduced fuel consumption.

Special Features:

• Balances “Iron Triangle” of Payload, Protection, and Performance.

• Transportable via rotary wing assets at Essential Combat Configuration and sealift on height restricted decks.

• Commonality beyond major components, to include repair parts, tool, training, system design, maintenance procedures and source of supply.

Contractors:

• TBD through full and open competition



Recommended Acquisition Strategy

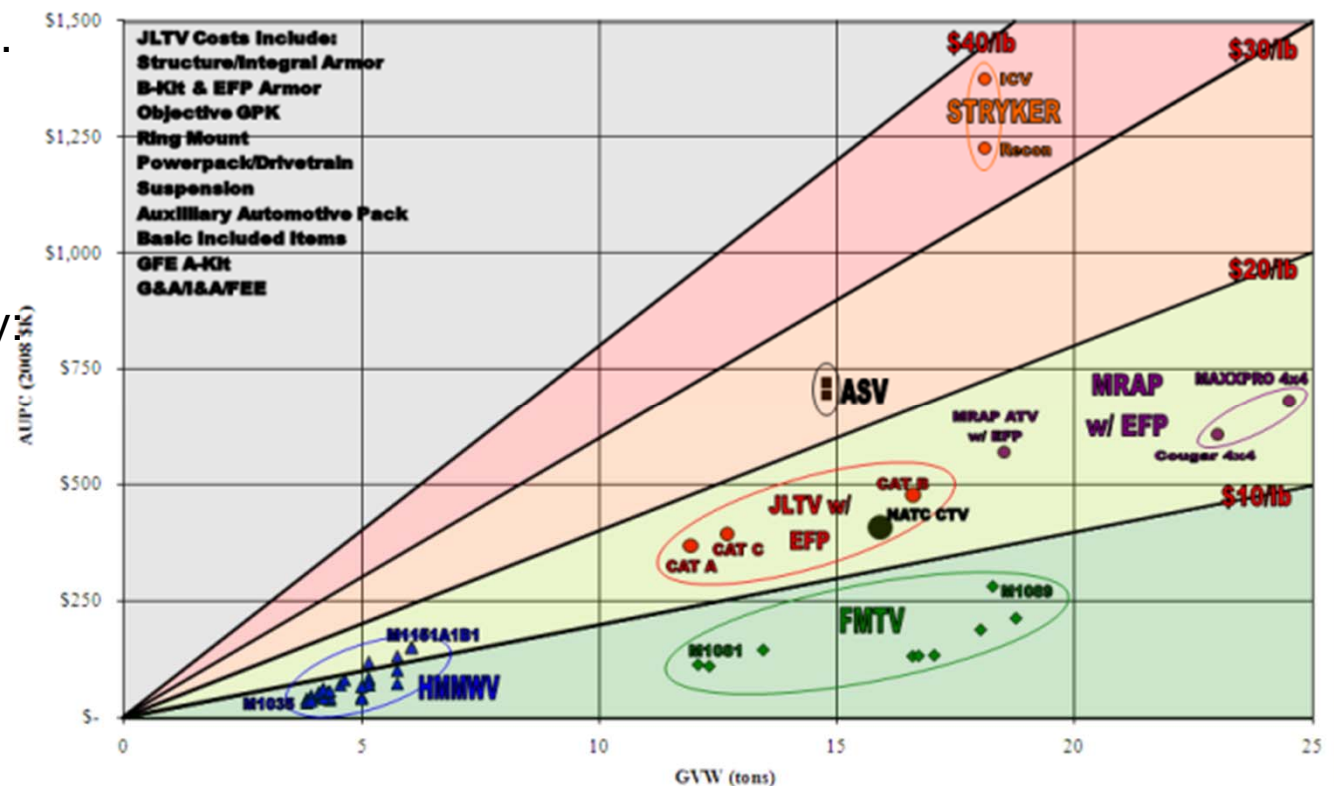
- **Pursue CPFF/CPIF contract type**
- **EMD proposal that indicates Gov't intention to purchase the TDP in the next program phase. Part of downselect RFP for PD phase.**
- **PD contract includes LRIP with options for TDP in Full Rate Production**



Open Capability Issues: Cost

- At start of TD Phase in 2007, JLTV AUMC = \$425k
- During TD Phase, JLTV Combat and Materiel Developers refined CDD and Specification to reduce cost to approx. ~\$350k. (principally driven via reductions in C4I & power generation requirements) The shift towards lighter vehicles alone will drive further reductions in AUMC, assuming no change to quantities.
- Vehicle weight is a historical indicator of cost. Based on historical data, MATV (\$15/lb), MRAP (\$14/lb) and ECV (\$12.5/lb).
- Bounding Parametrically: 20k lbs @ \$15/lb = \$300k

JLTV will deliver an advanced capability; Approximately \$300k is a reasonable target area for vehicle basic unit cost / AUMC



* When possible, all costs are given in BY



JLTV Cost Model Updates

Prior WSR Estimate to Current Estimate Nov 2010

RDTE Estimate Changes/Impacts:

- 24 month EMD program schedule increased to 48 months.
- JLTV Family of Vehicles (Categories and sub-configuration definitions) updated per Knowledge Points 4 and 5.
- Increased development engineering efforts due to updated FOV definition (i.e. TD prototype solutions not carrying forward into EMD) and enhanced focus on SE process and documentation.
- Army responsible for 100% of development costs for BCOTM and Recon variants.
- Updated prototype & test estimates based on updated test quantities and test events.
- Updated estimate to include risk due to 2009 Weapon Systems Acquisition Reform Act.

Procurement Estimate Changes/Impacts:

- Production starts in 1Q FY16 in lieu of 4Q FY13.
- Adjusted unit manufacturing cost to account for enhanced protection requirement .
- Updated TADDS requirement from 252 CDTs to 78 CDTs , 254 JEATs to 27 JEATs, addition of 58 HOTs and deletion of RVTTs.
- Production schedule went from FY13-FY21 to FY16 - FY41 to align with TWV Strategy. (Max Rate production 10K/yr dropped to less than 5K/yr and then 2300/yr when USMC has procured their requirement)
- Updated estimate to include risk due to 2009 Weapon Systems Acquisition Reform Act.