



# ***Maneuver Requirements Division***

## ***Industry Day Breakout Session***

### **Agenda**

- MRD Overview**
- Combat Capabilities Branch**
- Maneuver Systems and Electrification Branch**
- Questions / Discussion**



# Maneuver Capabilities Development and Integration Directorate

**The Maneuver Capabilities Development and Integration Directorate (MCDID) determines and develops future force capabilities and future infantry, armor, and robotic requirements across the Doctrine, Organization, Training, Materiel, Leadership Development, Personnel, and Facilities (DOTMLPF) domains, resulting in a trained and ready maneuver force fully integrated into Army, Combined, and Joint operations, to maintain the battlefield primacy of our Soldiers and the formations in which they fight.**

**Concepts Development Division**



- Organizational Force Design Updates
- Concepts (Maneuver Force)
- Threat Analysis
- Studies and Analysis
- Science and Technology

**Maneuver Battle Lab**



- Live and Constructive Experimentation
- Assess Concepts / Inform Organization Design
- Enable Soldier and Small Unit Modernization
- Iterate S&T to Military Utility / Inform Investment
- R&D Risk Reduction and POR Transition
- Army Expeditionary Warrior Experiment

**Maneuver Requirements Division**



- Manned Combat Vehicles
- Combat Vehicle Electrification
- Large / Medium Caliber Weapons / Ammo
- Platform Missiles / Mortars

**Soldier Requirements Division**



- Soldier Systems
- Soldier Protection
- Small Arms
- Optics / Sensors / Lasers
- Mortars / Missiles

**Robotics Requirements Division**



- Ground Systems
- Air Systems / cUAS
- Universal Robotic Controller
- HMI / Art Intel
- Autonomy

**Mission Command Requirements Division**



- Mounted Mission Command
- S / T / C&S
- JBC-P
- Dismounted Mission Command
- NETT Warrior
- Fused Awareness System
- Command Post

**Army Capability Managers DOTMLPF-P Integration**



Armored Brigade Combat Team & Reconnaissance    
 Infantry Brigade Combat Team    
 Stryker Brigade Combat Team    
 Security Force Assistance Brigade

**MCDID executes its mission across four functional pillars:**

- Concepts – critical thinking to solve the problems of future combat
- **Experimentation – analyzes potential solutions**
- **Requirements – determine and derive capabilities required for future battlefields**
- **Integration – of solutions into our formations**



# MRD Mission

**MRD determines and develops operational capabilities and materiel requirements for ground maneuver combat platforms and their ancillary sub-systems to maintain the battlefield primacy of our Soldiers and the formations in which they fight.**

## Combat Capabilities Branch

- Vehicle Protection Suite
- Sensors (IFLIR, LRAS3, FALCONS, ITAS/MITAS)
- TOW/Close Combat Missile System (CCMS-H)
- Ammunition
- Composite Rubber Track (CRT)
- Directed Energy

## Maneuver Systems & Electrification Branch

- Abrams
- Bradley
- Stryker
- AMPV
- NGMBT\*
- MTMS
- Infantry Squad Vehicle (ISV)\*
- Electric Light Reconnaissance Vehicle (eLRV)
- Tactical & Combat Vehicle Electrification
- CATV/ARCTIC
- MRAP/MATV
- MPF\*

***Responsible for, or in support of over 20 Lines of Effort***

\* Denotes efforts in support of other agencies

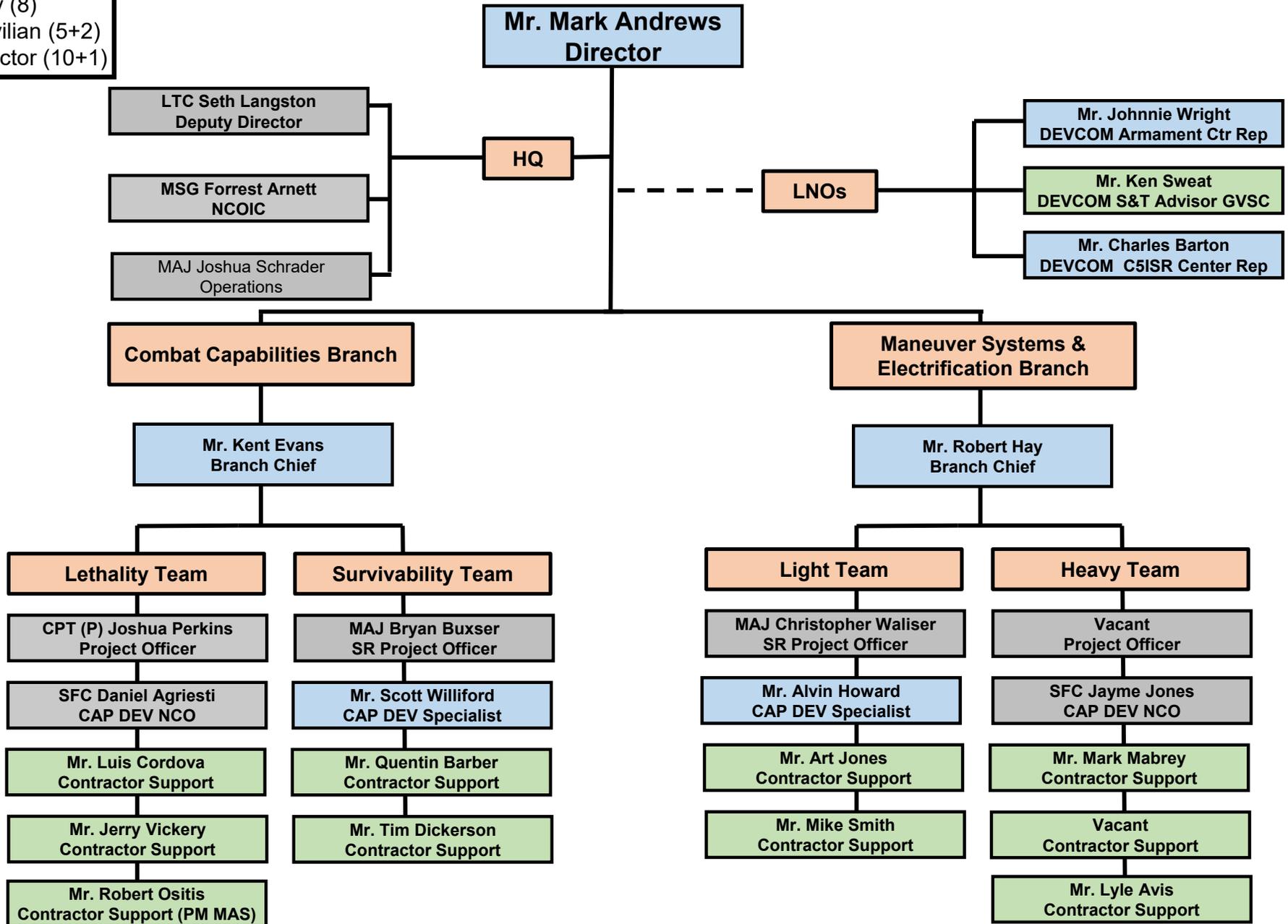


U.S. ARMY

# MRD Organization



Military (8)  
 DA Civilian (5+2)  
 Contractor (10+1)



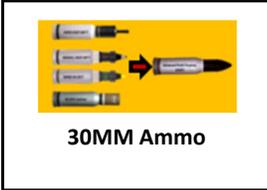


# Portfolio Overview

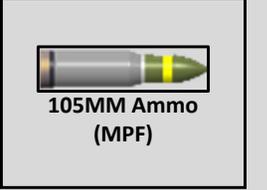
**ABCT**

 AMPV	 XM30*/50MM*
 ABRAMS/NGMBT*	 120MM Ammo
 HERCULES*	 BRADLEY/25MM Ammo

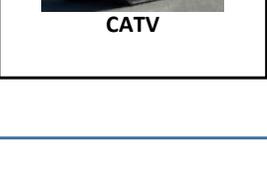
**SBCT**

 Stryker*
 30MM Ammo

**IBCT**

 M10 Booker (MPF)*
 ISV*/eLRV
 105MM Ammo (MPF)
 MLRPSM—DR*

**Enablers**

 3 GEN FLIR/FALCONS
 VPS
 Capability Transition and Product Integration (CTPI)
 TOW/CCMS-H/ITAS
 CATV

-  Enduring
-  Modernization
-  Legacy

**Acronym List**

AMPV – Armored Multi-purpose Vehicle  
 CATV – Cold Weather All Terrain Vehicle  
 CCMS-H – Close Combat Missile System - Heavy  
 eLRV – electric Light Reconnaissance Vehicle  
 FALCONS – Future Advanced Long-range Common Optical/Netted-Fires Sensor  
 FLIR – Forward Looking Infrared  
 HERCULES – Heavy Equipment Recovery Combat Utility Lift Evacuation System  
 ISV – Infantry Squad Vehicle  
 VPS – Vehicle Protection Suite  
 MLRPSM – Mobile Long Range Precision Strike Missile

\*Denotes efforts in coordination with, or in support of other agencies.



# ***Duties and Functions***

- 1. Capability Development for ground combat maneuver platforms (current force and selected participation in future systems).***
  - Requirements (JCIDS/Section 804 Middle Tier Acquisition)
  - Engineering Change Proposal (ECP) Management
  - Test and Evaluation
  
- 2. Capability Development for relevant ground maneuver vehicle ancillary systems and sub-systems***
  - Vehicle Protection Suites (Systems)
  - Sensor Systems (Vehicle Based)
  - Lethality (Med/Large Caliber Weapons)
  - Ammo (Med/Large Caliber)
  
- 3. Science and Technology Development in support of ground maneuver platforms and their ancillary systems.***
  
- 4. Shape FD portfolio (Maneuver, and selected participation for Ammunition)***
  - SPAR/POM/S&T Deep Dives



# ***Combat Capabilities Branch***

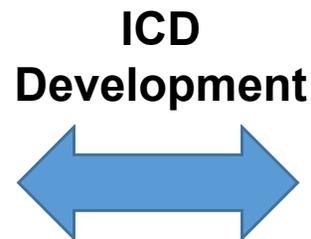


# Layered Formation Protection



## Current Status:

- *VPS is the umbrella program for vehicle protection*
- *SIMEX VPS Spiral A study 2017*
- *VPS CDD AROC approved Nov 2020.*
- *MITRE Study Cooperative Protection 2021*
- *SIMEX Cooperative Protection 2022*
- *VPS Governance Board continue analysis of cooperative protection*
- *GVSC Maneuver Operations Protection Concept 2022*
- *TTX 23-7 Layered Formation Protection*
- *SIMEX 24-7 Formation Base Protection*



## ICD Layered Formation Protection Capabilities:

- **Seek ICD Approval**
  - **Sensor Requirements**
  - **Network Requirements**
  - **Artificial Intelligence**
  - **Advanced Countermeasures**
- **What don't we know???**
  - **Manned/ Unmanned teaming**
  - **Technology Mix to achieve desired effects**

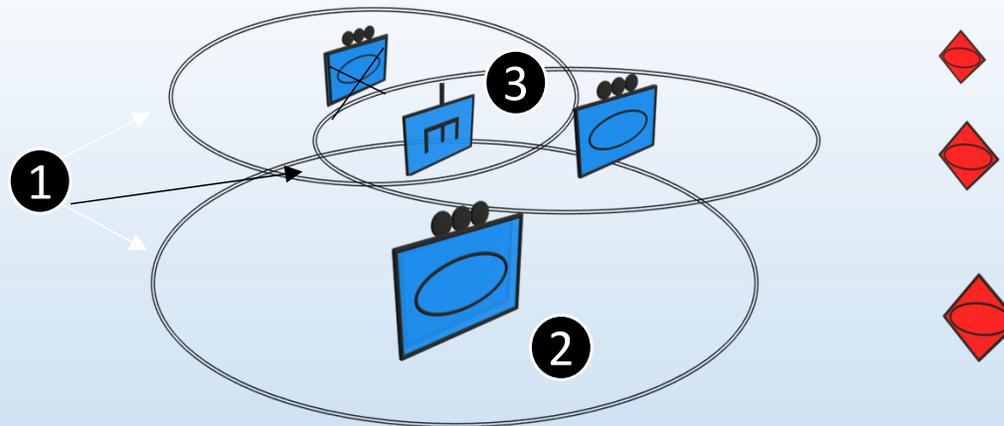


U.S. ARMY



# Operational Concept

1. Figure below shows graphical depiction of platoons working collaboratively while enabled with a protection layer of VPS Technologies (**Cooperative Protection**).
2. Within each dome platforms equipped with VPS Technologies work together to protect adjacent platforms (**Collaborative Protection**).
3. When multiple domes of protection work collaboratively and cooperatively, platforms/areas without VPS capabilities are protected (**Covered Protection**).



- **Cooperative Protection**
  - “We share data, but I protect me, and you protect you”
  - Formation – Individual VPS Equipped platforms
- **Collaborative Protection**
  - “We share data and use it to protect each other to optimize the performance of the group”
  - Adjacent VPS Equipped Platforms (usually Platoons)
- **Covered Protection**
  - “Protection is provided by assets placed in strategic positions with assigned areas of responsibility”
  - Formation: Companies, Platoons, Non-VPS Equipped Assets



# *Large Caliber Munitions*

## **Area of Interest**

Provide lethal effects and the ability to shape the battlefield such as with Surveillance, Obscuration and Deception at tactically relevant distances using the fielded Main Battle Tank.

## **Desired Capabilities**

Ability to engage threat at extended distances (ELOS/BLOS) to defeat ATGM teams and provide commanders with the operational flexibility to confront the enemy using a layered, lethal approach.

## **Other Considerations**

- Platform Fire Control System
- Form Factor
- Auto-Loaded (Future)



# ***Other Area of Interest***

## **Background**

On going conflicts in Ukraine and Gaza have highlighted drone attacks which pose a significant threat against our ground maneuver platforms. Defending the skies against drone threats is essential in achieving mission-critical success for the BCTs.

## **Area of Interest**

Bradley

Abrams

Stryker

Layered approach

Current and Future Combat Platforms



# ***Maneuver Systems & Electrification***



# Tactical and Combat Vehicle - Electrification (TaCV-E)

The TaCV-E Initial Capability Document (ICD) was Joint Capabilities Board (JCB) validated (2DEC21) enabling Services to inform/pursue ground vehicle electrification through:

- Electric Propulsion
- Installation Power Generation/Recharging
- Mobile Power Generation/Sustainment Energy Storage & Power Distribution
- Energy Storage
- Power Management
- Demand Reduction

## Current Efforts

**Increasing Demand Reduction and Operational Duration through improvements in:** Anti-idle technologies, electrification of vehicle auxiliary systems, improvements in hybridization, multi-vehicle networking/micro-gridding and the ability to leverage host nation grid.

**Range Extender Gap:** Need for power dense, modular, and scalable range extender.

**Improve Power Storage, Distribution & Recharge Technologies:** Improvements in battery density, rapid & mobile recharging and power management technologies.

**Mobility Enhancement:** Meet or exceed (speed, grade, and range) requirements. Introduces tactical silent mobility. Increased mobility also improves lethality & survivability.

**Signature Management: Improvements in Acoustic & Thermal reduction:** Thermal heat rejection and audible signature reduction reduces threat acquisition probability and increases silent watch duration. This leads to increased lethality & survivability.

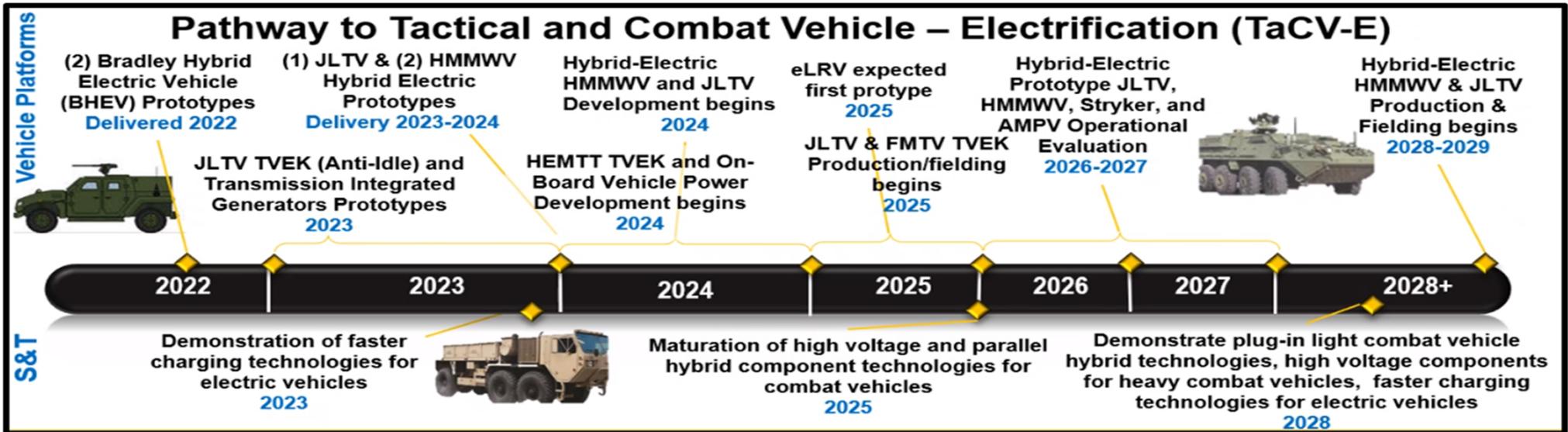
**Integration of Advanced Electric Warfighting Systems:** setting conditions to integrate systems such as directed energy weapons, high power communications, command-and-control on-the-move, high power jamming, vehicle networking/micro-gridding.

**Fewer Towed Generators:** Supporting improvements in cost and availability of strategic lift and improved mobility.

**Inform DOTMLPF-P Implications and Efficiencies:** Through studies, modeling and simulation and prototyping.



# Electrification Pathway

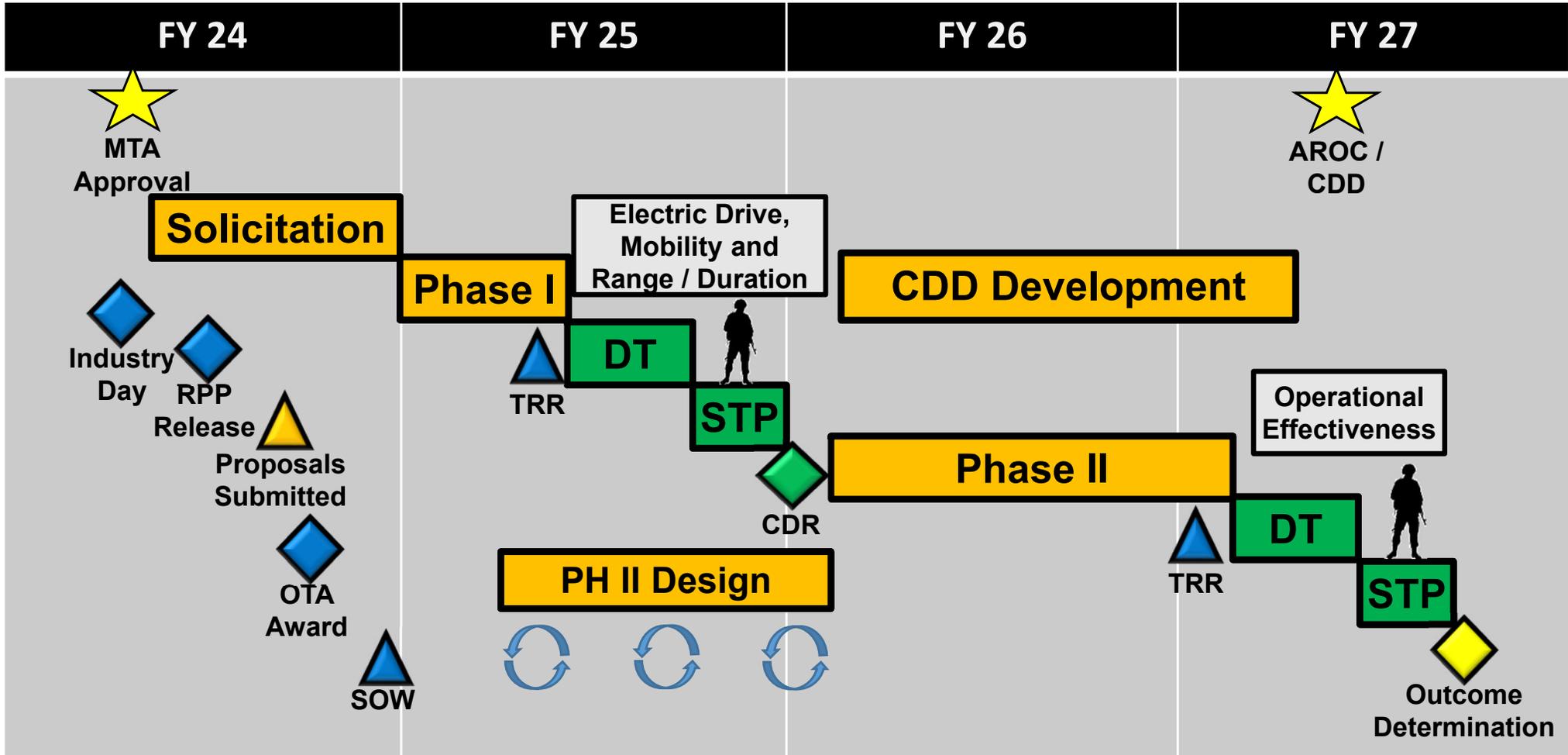


	Near (2022-2027)	Mid (2028-2037)	Far (2038-2050+)	
<b>Focus</b>	<b>Light Vehicle Fleet</b>	<b>Medium Vehicle Fleet</b>	<b>Heavy Vehicle Fleet</b>	
	<ul style="list-style-type: none"> <li>Light Tactical Vehicles</li> <li>Up to 2.5 tons Payload</li> <li>Wheeled Combat Vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Tactical Support/Service Support Vehicles up to 10-ton Payload</li> <li>Combat vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Tactical Support / Service Support Vehicles over 10-ton Payload</li> <li>Combat Vehicles</li> </ul>	<b>End State</b>
	<ul style="list-style-type: none"> <li>All-Electric Vehicles</li> <li>All-Electric Combat Vehicles (AECV)</li> <li>All-Electric Sustainment Capabilities</li> </ul>			

**Build, Test, Learn & Adjust**

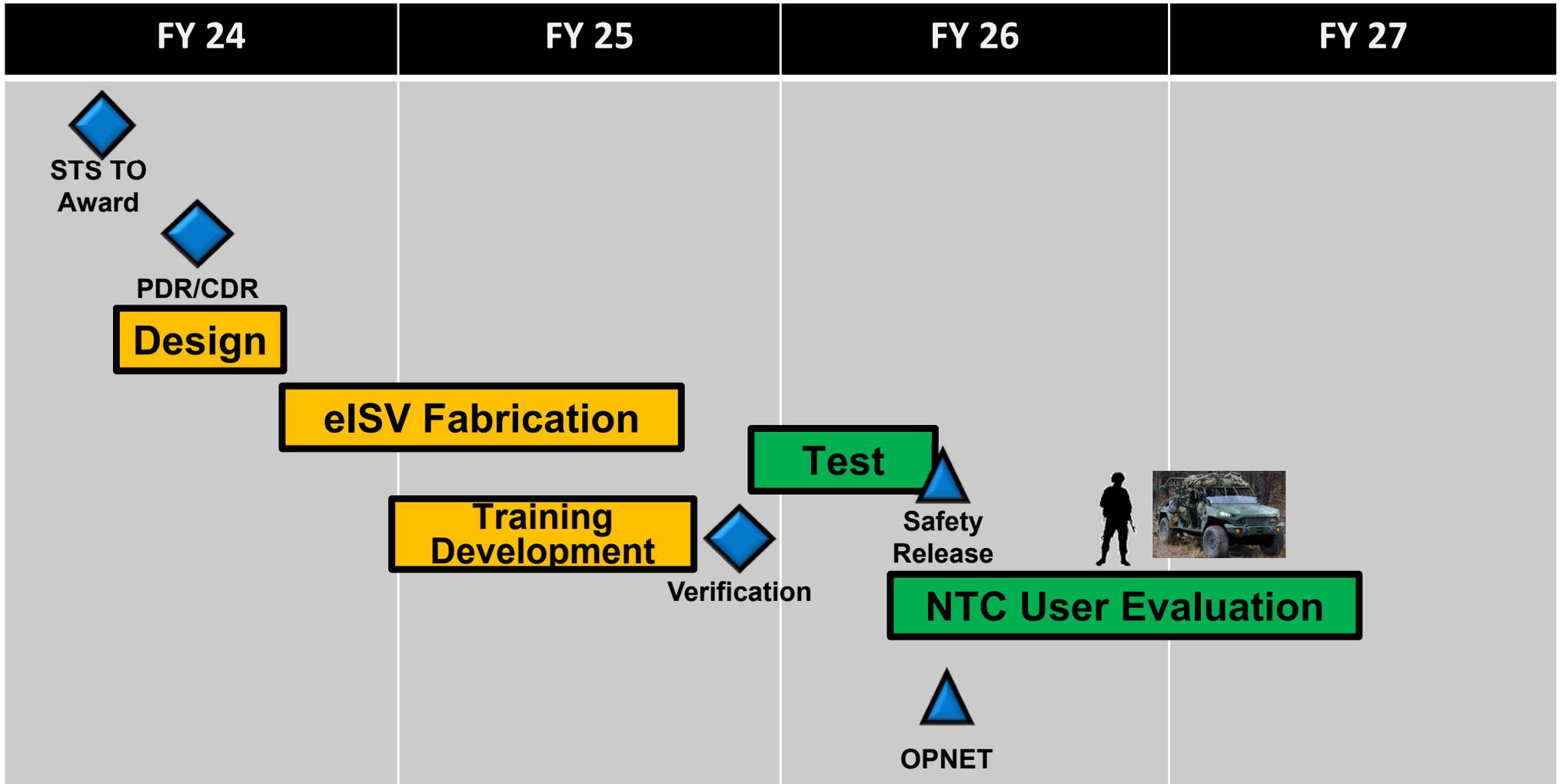


# eLRV Prototyping Path



**eLRV is the most cost-effective solution to determine viability of a military electrified platform in an operational context.**

# eISV Prototyping Path



**eISV is an electrical mobility event to determine viability of retrofitting an electrified powertrain into the existing ISV platform.**



# *Questions / Discussion*



# MRD Government Contacts



7533 Holtz Street  
Building 70  
Fort Moore, Georgia 31905

**Mr. Mark Andrews**  
Director  
Suite 3080  
O: 706-626-1225  
C: 706-402-2944  
mark.r.andrews.civ@army.mil

**MSG Forrest Arnett**  
NCOIC  
Suite 3079  
O: 706-545-6575  
C: 706-888-5448  
forrest.j.arnett.mil@army.mil

**LTC Seth Langston**  
Deputy Director  
Suite 3078  
O: 706-545-3305  
C: 706-402-2352  
seth.e.langston.mil@army.mil

## Combat Capabilities Branch

## Maneuver Systems & Electrification Branch

**Mr. Kent Evans**  
Deputy Branch Chief (Acting Chief)  
O: 706-545-5413  
kent.a.evans.civ@army.mil

**Mr. Robert Hay**  
Deputy Branch Chief (Acting Chief)  
O: 706-545-4689  
robert.a.hay2.civ@army.mil

**MAJ Bryan Buxser**  
Sr. Project Officer  
O: 706-545-1915  
bryan.m.buxser.mil@army.mil

**MAJ Chris Waliser**  
Sr. Project Officer  
O: 706-545-1087  
christopher.a.waliser.mil@army.mil

**Vernon (Scott) Williford**  
Capability Development Specialist  
O: 706-626-8615  
vernon.s.williford.civ@army.mil

**Mr. Al Howard**  
Capability Development Specialist  
O: 706-545-2886  
alvin.howard.civ@army.mil

**CPT (P) Joshua Perkins**  
Project Officer  
O: 706-545-4170  
joshua.a.perkins.mil@army.mil

**Vacant**  
Project Officer  
O: 706-545-7688

**SFC Daniel Agriesti**  
Combat Development NCO  
daniel.agriesti.mil@army.mil

**SFC Jayme Jones**  
Combat Development NCO  
jayme.d.jones2.mil@army.mil