



Micro-Aerial Vehicles A Tactical Perspective

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TRADOC: Where Tomorrow's Victories Begin

AGENDA

- **Emerging Framework**
- **Increasing Role of UAVs**
- **UAV Strategy**
- **Current UAVs**
- **Future Force Development Video**
- **FCS UAV Concepts and Requirements**
- **Summary**

Emerging Framework “Reconnaissance Enabled”

ENTRY OPERATIONS

ACTIONS BEFORE FORCES ARE JOINED

- Develop Situation out of contact
- Decide, When / Where to fight
- Set conditions
- Maneuver to position of advantage



ACTIONS DURING CONTACT

- Initiate decisive combat at chosen time/place
- Continue to develop the situation in contact
- Continue to integrate intelligence, surveillance, reconnaissance, maneuver, fires, and the network

TACTICAL ASSAULT

- Finish the engagement through assault (if necessary)



TRANSITIONS

Transition to next
engagement

Increasing Role of UAVs

- **Increasing UAV Applications in the Tactical Force**
 - **Urban Reconnaissance**
 - Around the corner vs. over the hill
 - Maneuvering UAV in the Urban Environment
 - **Protecting the Force**
 - IED Detection
 - Chemical, Biological, Radiological Nuclear (CBRN) Detection
 - Perimeter/Area Security
 - **Non-Line of Sight Target Engagement (Target Designation)**
 - **Communications Relay Package (CRP)**
- **Tactical Requirements**
 - **Lighter Weight (Hover/Stare Capability), Greater Endurance**
 - **Greater Transportability/Fewer Manpower Requirements**
 - **Quite Design/Increased Survivability**
 - **Greater Operational Availability/ Less Maintenance Complexity**
 - **Greater Sensor/Payload volume**
 - **Day/Night/Adverse Weather**

UAV STRATEGY

	CURRENT FORCE	MODULAR FORCE	FUTURE FORCE
PLATOON / CLASS I	RAVEN	RAVEN	DARPA MAV
COMPANY / CLASS II	NO NEAR-MID TERM REQ'D CAPABILITY		DARPA OAV
BATTALION / CLASS III			DARPA DPX-5
BRIGADE / CLASS IV	SHADOW	SHADOW	
	IVA		FIRE SCOUT
IVB	NO NEAR-MID TERM IVB REQ'D CAPABILITY		HUNTER → ER/MP

DISMOUNT/RAVEN



CHARACTERISTICS/DESCRIPTION

- **Wing Span** 4 ft 3in
- **Length** 3ft 7in
- **Weight:** 4.2 lbs
- **Range:** 6.2 miles
- **Service Ceiling** 15000ft
- **Endurance (Mins):** 60-80 min
- **Speed:** 60 mph
- **Payload(s):** CCD color video, IR
- **Operating Alt.** 100-1000ft

MISSION

Army tactical level reconnaissance, surveillance, target acquisition, and battle damage assessment

CAPABILITIES

- Hand Launched
- Quick Assembly
- Man Portable / Backpackable
- Crew / Manpower: 2 Soldiers
- GPS Waypoint Navigation or remote flight
- Auto return to launch point

BRIGADE/SHADOW 200



MISSION

Army tactical level reconnaissance, surveillance, target acquisition, and battle damage assessment

CAPABILITIES

- Automatic Landing and Takeoff
- Command and control from multiple stations
- GPS Navigation

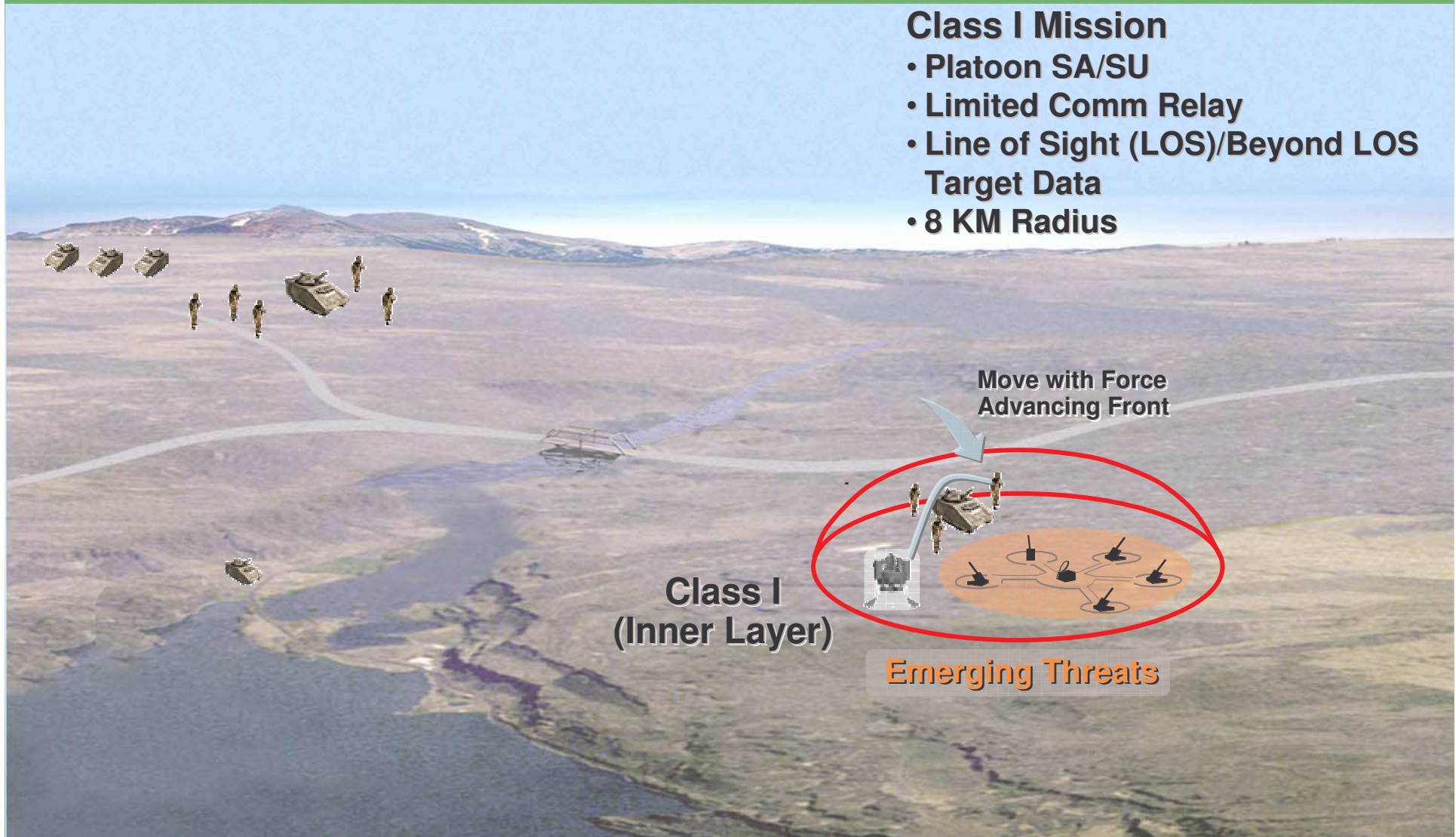
CHARACTERISTICS/DESCRIPTION

- Wing Span 12.3ft
- Length 11.2ft
- Weight 350 lbs
- Power 38hp rotary
- Fuel Motor gasoline
- Range ~ 125 km
- Airspeed 84 kt
- Operating Alt. 6,000-10,000 Ft
- Endurance 4 Hours at 50K radius
- Max range 125 Km
- Primary Payload (s) EO / IR

DISMOUNT/CLASS I UAVS CONCEPT

Class I Mission

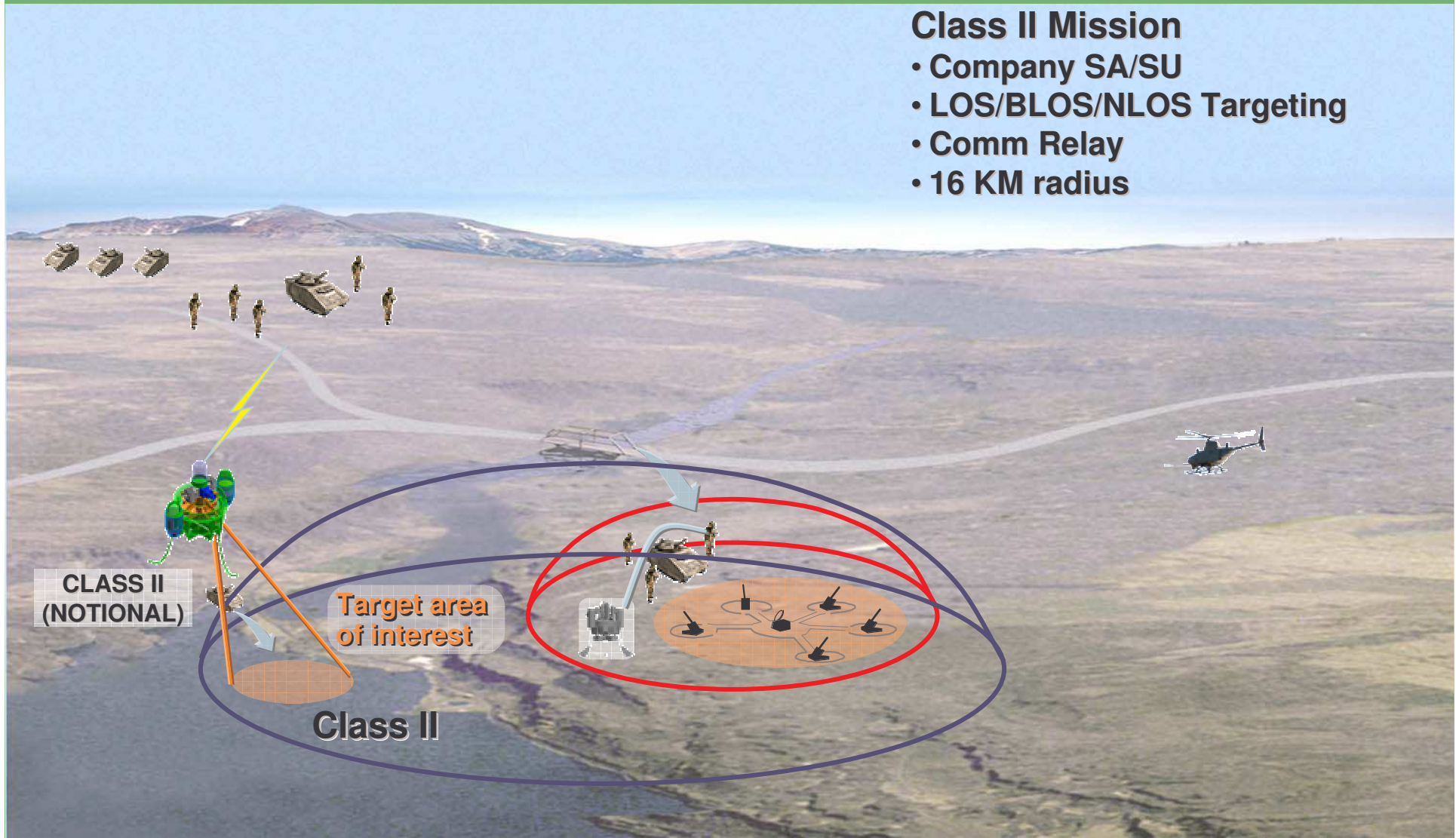
- Platoon SA/SU
- Limited Comm Relay
- Line of Sight (LOS)/Beyond LOS Target Data
- 8 KM Radius



COMPANY/CLASS II UAVS CONCEPT

Class II Mission

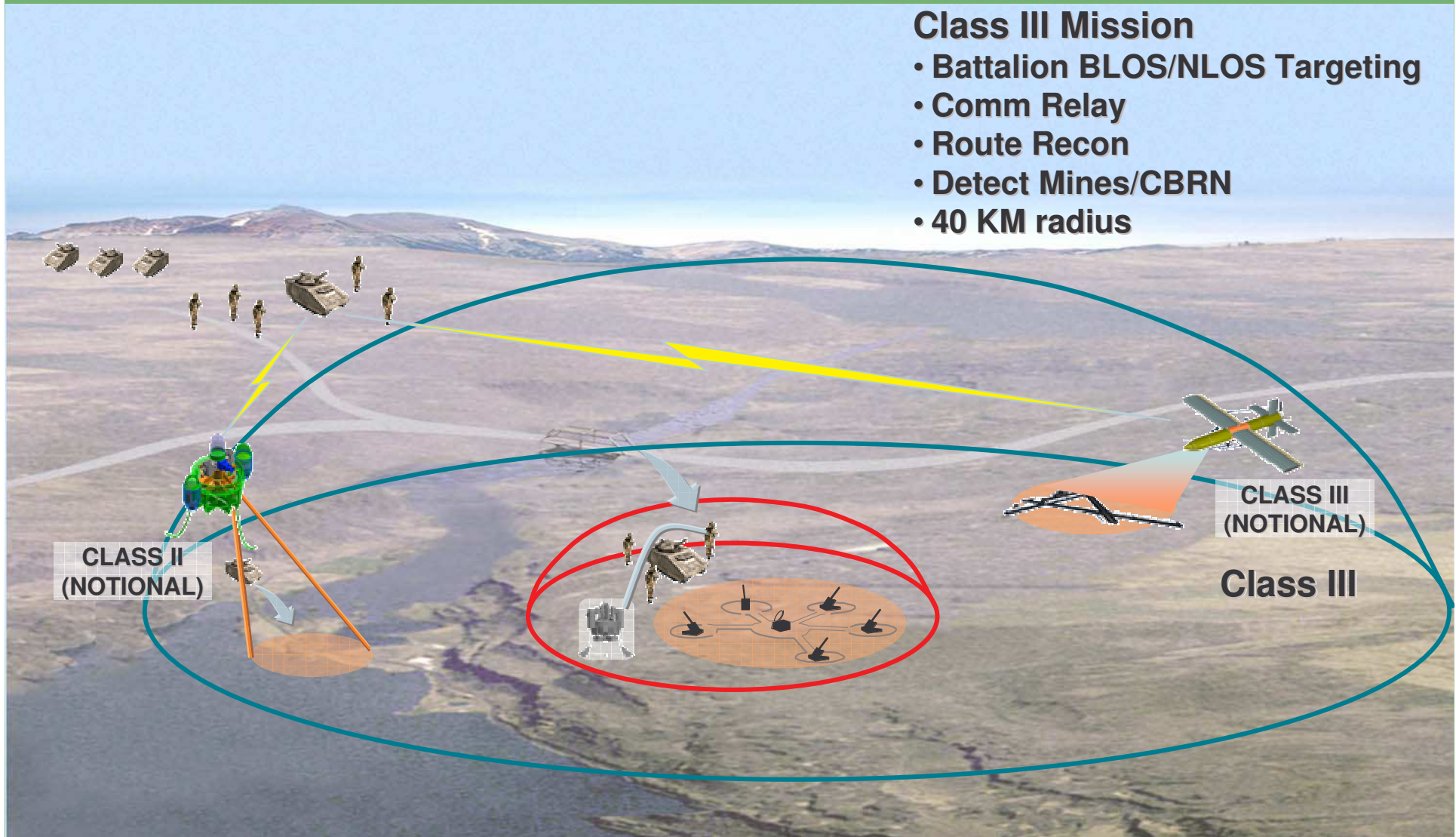
- Company SA/SU
- LOS/BLOS/NLOS Targeting
- Comm Relay
- 16 KM radius



BATTALION/CLASS III UAVS CONCEPT

Class III Mission

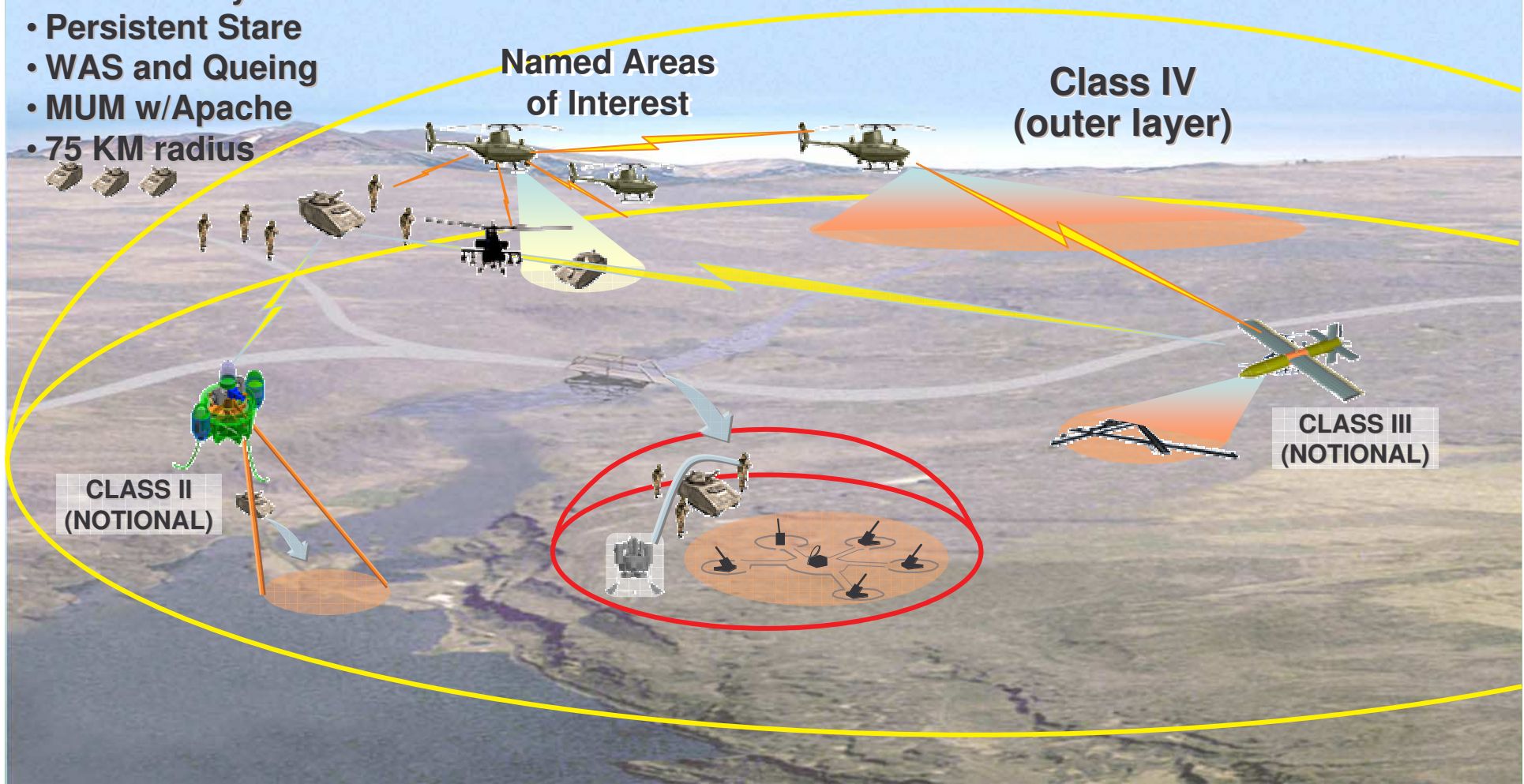
- Battalion BLOS/NLOS Targeting
- Comm Relay
- Route Recon
- Detect Mines/CBRN
- 40 KM radius



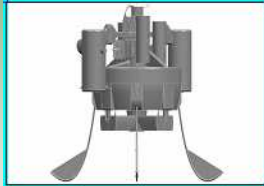
BATTALION/CLASS IV UAVS CONCEPT

Class IV Mission

- Comm Relay
- Persistent Stare
- WAS and Queing
- MUM w/Apache
- 75 KM radius



FCS UAV Key Capabilities and Driving Requirements



Class I UAV

- Platoon UAV
- 5-10 lb Vehicle
- Capabilities
 - RSTA
 - Limited Comm Relay (Narrow Band)

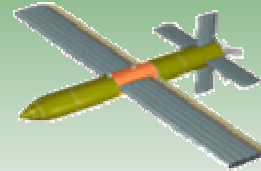
- Threshold Requirements
 - 50 Min Time on Station
 - Launch/Recovery at 10,000 Ft MSL Field Elevation
 - Man Pack (35 Lb Sys)
 - Hover and Stare
 - Level V dismount control
 - Inaudible @ 500 Ft



Class II UAV

- Company UAV
- <112 lb Vehicle*
- Capabilities
 - Company SA/SU in Complex Terrain
 - LOS/BLOS Targeting
 - Limited Comm Relay (Extension)

- Threshold Requirements
 - 2 Hr Time on Station
 - Launch/Recovery at 10,000 Ft MSL Field Elevation
 - Target Aqu/Des to 2 KM
 - Range Find to 3 KM, ID at 1 KM
 - 25m Target Location Error
 - Hover and Stare
 - *Two Soldier Remount
 - Inaudible @ 500 Ft



Class III UAV

- Battalion UAV
- 300-500 lb Vehicle*
- Capabilities
 - BLOS/NLOS Targeting
 - Wideband Comm Relay
 - Mine Field Detection
 - CBRN Detection
 - Met Survey

- Threshold Requirements
 - 6 Hr Time on Station
 - Launch/Recovery at 10,000 Ft MSL Field Elevation
 - Target Aqu/Des to 4 KM
 - 25m Target Location Error
 - Range Find to 8 KM
 - ID Target at 2 KM
 - *2 Soldier Lift major subsystems



Class IVa/b UAV

- Brigade UAV
- >3000 Lb Vehicle
- Capabilities
 - RSTA
 - Wide Area Surv.
 - Wideband Comm Relay
 - Persistent Stare
 - Standoff CRBN Detection
 - Met Data for NLOS

- Threshold Requirements
 - 72 Hr Cont. Ops (C-IV system)
 - 24 Hr Cont. Ops (CI-IVb AV)
 - Launch/Recovery at 10,000 Ft MSL Field Elevation
 - Target Acq./Designation
 - 25m Target Location Error
 - Automatic L&R from 100mx 50m
 - Operate in High/Hot (4,000 ft Pressure Atmosphere, and 95 Deg F)
 - Manned Unmanned Teaming

SUMMARY

Unmanned Aerial Vehicle System Modernization Strategy

