



The Importance of Research and Analysis to the Military

Director General Capability

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Contents

- A bit of history
- Centralisation
- Operations
- Decentralisation
- Evidence Based Decision Making



WW1 – ‘The Chemists War’

- First large scale mobilisation of ‘science’
- Emergence of poison
& advanced high explosives
- Physicists’ contribution
 - Wireless communications
 - Sound based detection methods



Battle of Estaires, 1918



WW2 – ‘The Physicists’ War’

- Heavy German and Allied Investment
 - German Nuclear Energy Project
 - US Office of Scientific Research and Development (origins of the Manhattan Project)
- Rocket Science
- Long Wave Radar



Hiroshima, March 1946



The Cold War

- Scientific research continued benefit from military patronage during era of perceived imminent threat
 - Computer science and engineering shaped by military funding
 - Geosciences and astrophysics
 - Biological sciences



Centralisation

- McKinsey
- The Central Customer
- The rise of 'joint'
- Pressure Groups



Urgent Operational Requirements (UORs)

- Research pivotal during last decade
- > 5 billion spent on UORs since 2002
- 85% on force protection
- > £50 million on infantry kit
- > £50 million on medical kit



Courtesy of Andrew Linnett. Crown Copyright/MoD



Indicative 'on the man' cost in 2001 (adjusted to 2013 prices): **£1,200**

Indicative 'on the man' cost for Afghanistan (standard): **£33,500**



No Holiday Post Afghanistan

- 2010 SDSR assumptions
 - Defence not ring-fenced
 - Defence £38bn black hole
- Army re-organisation
 - Army 2020
- De-Centralisation



Policy baseline

Model C

Enduring
Stabilization
(6.5K)

Force Driving

Model B

Complex
Intervention
(2K)

Focussed
Intervention
(1K)

A

Model B

Complex
Intervention
(2K)

Alternate

Model B

Complex
Intervention
(2K)

Model A

Focused
Intervention
(1K)

Model C

Non-enduring Intervention
(up to 3 Bdes)

“Best Effort”



Types of Army Role 2015-2020

- Homeland defence and security support
- Small scale expeditionary operations
- Alliance reassurance operations
- Divisional level warfare preparations





De-Centralisation

“The Department should make increased use of evidence in decision-making” (Levene Report)

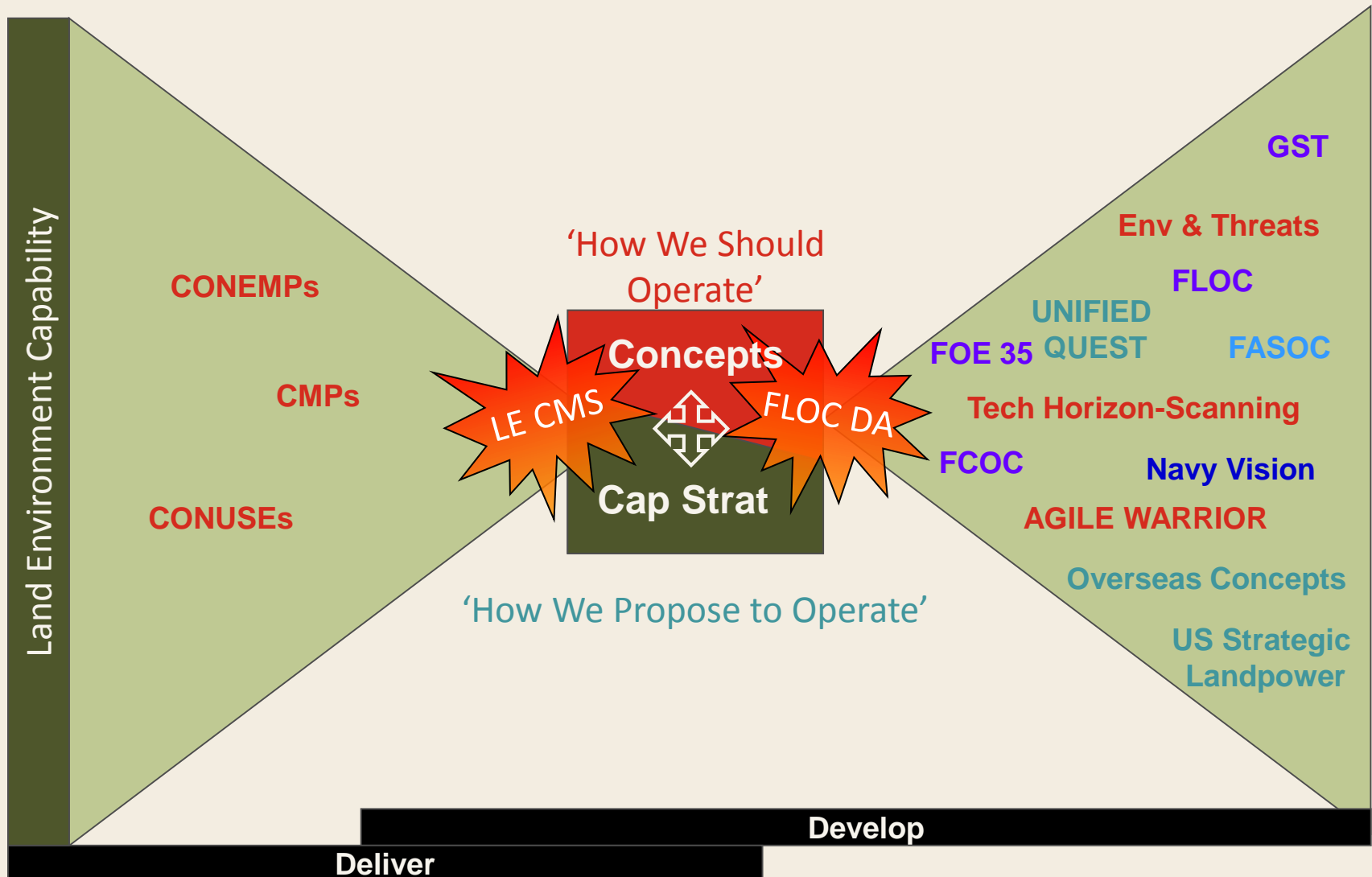


Evidence Based Decision Making

- Portfolio Level
 - Balance of Investment
- Programme Level
 - Financial Scrutiny
 - VfM
 - Competition
 - Requirement Scrutiny
 - Technical Scrutiny
- Boundaries

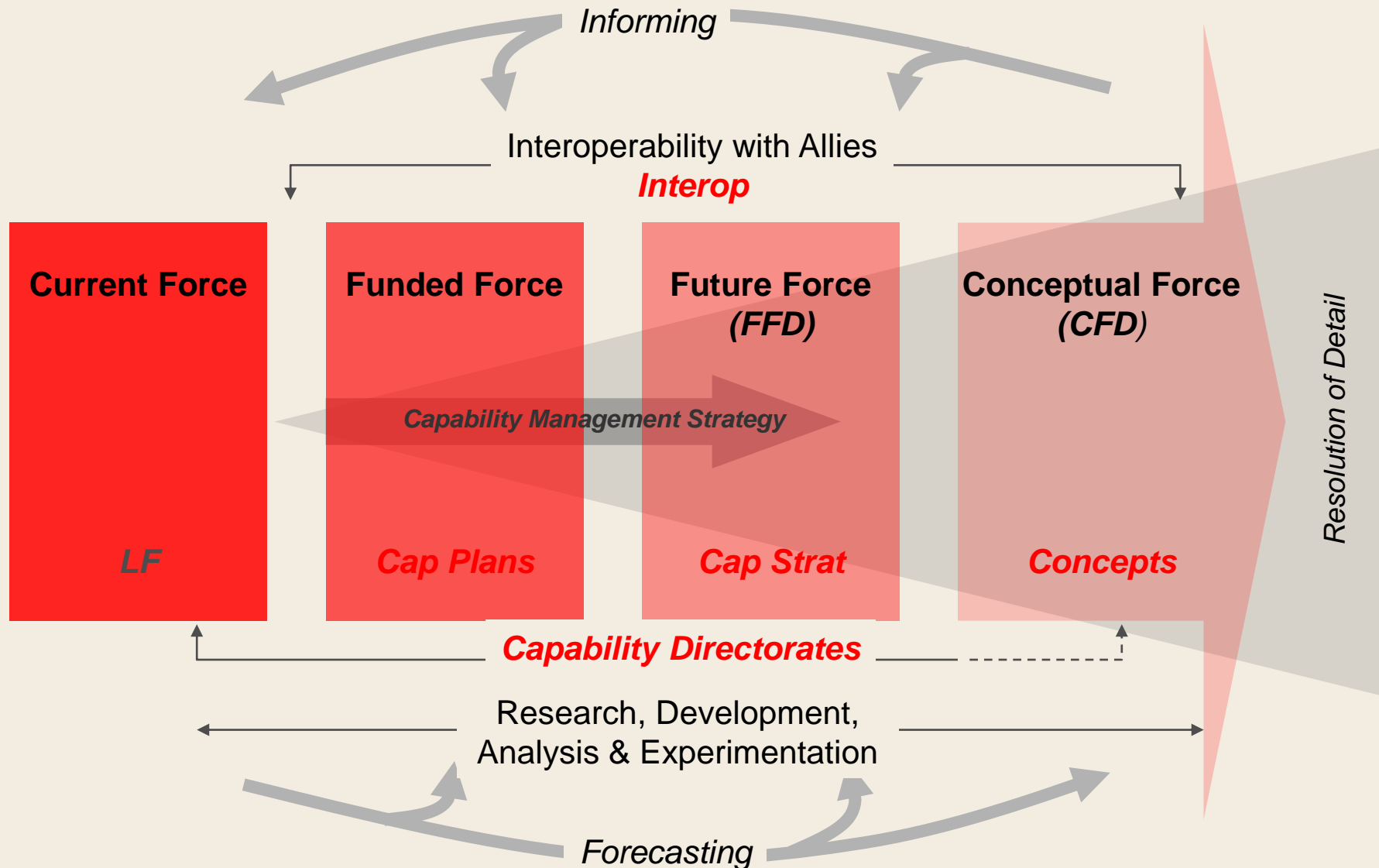


Concept to Capability





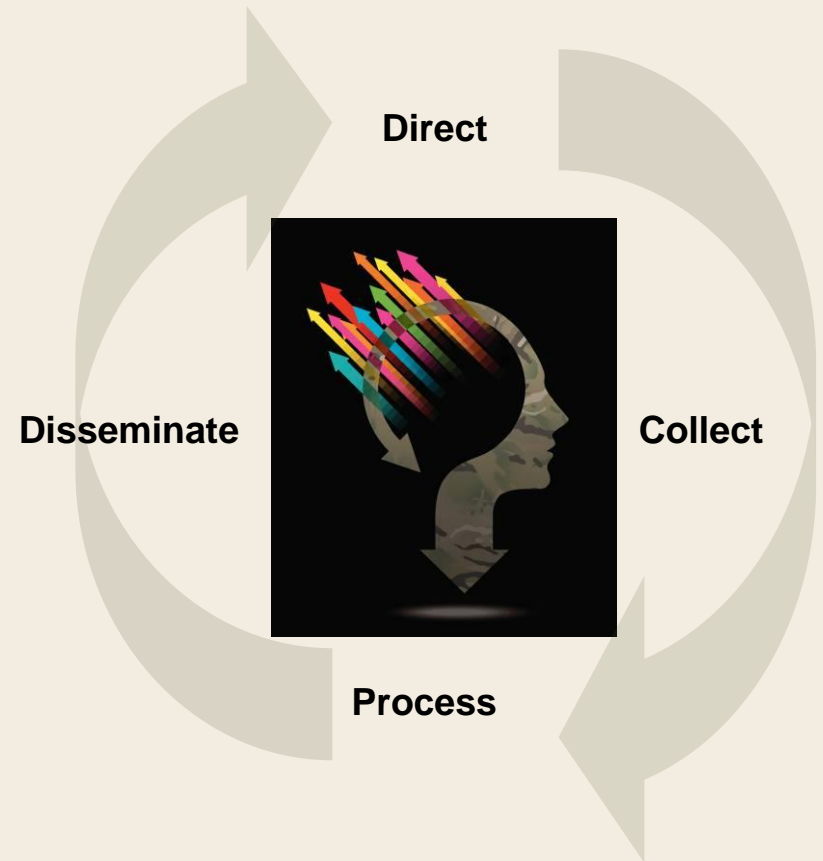
Capability Development Architecture





AGILE WARRIOR

- Examination of weaknesses, threats, challenges and opportunities for Army capability within a JIIM context.
- Generates evidence-based analysis to inform:
 - Army's narrative of what capabilities land forces require in the future
 - Continual transformation across all DLoDs.
- Underpinned by Master Question List and Integrated, Analysis and Experimentation Campaign Plans (IAECPs).





Master Question List

MQ 1. What are the characteristics of the FLOE?

MQ 2. How will land warfare develop and what contribution will land forces be able to make to future requirements?

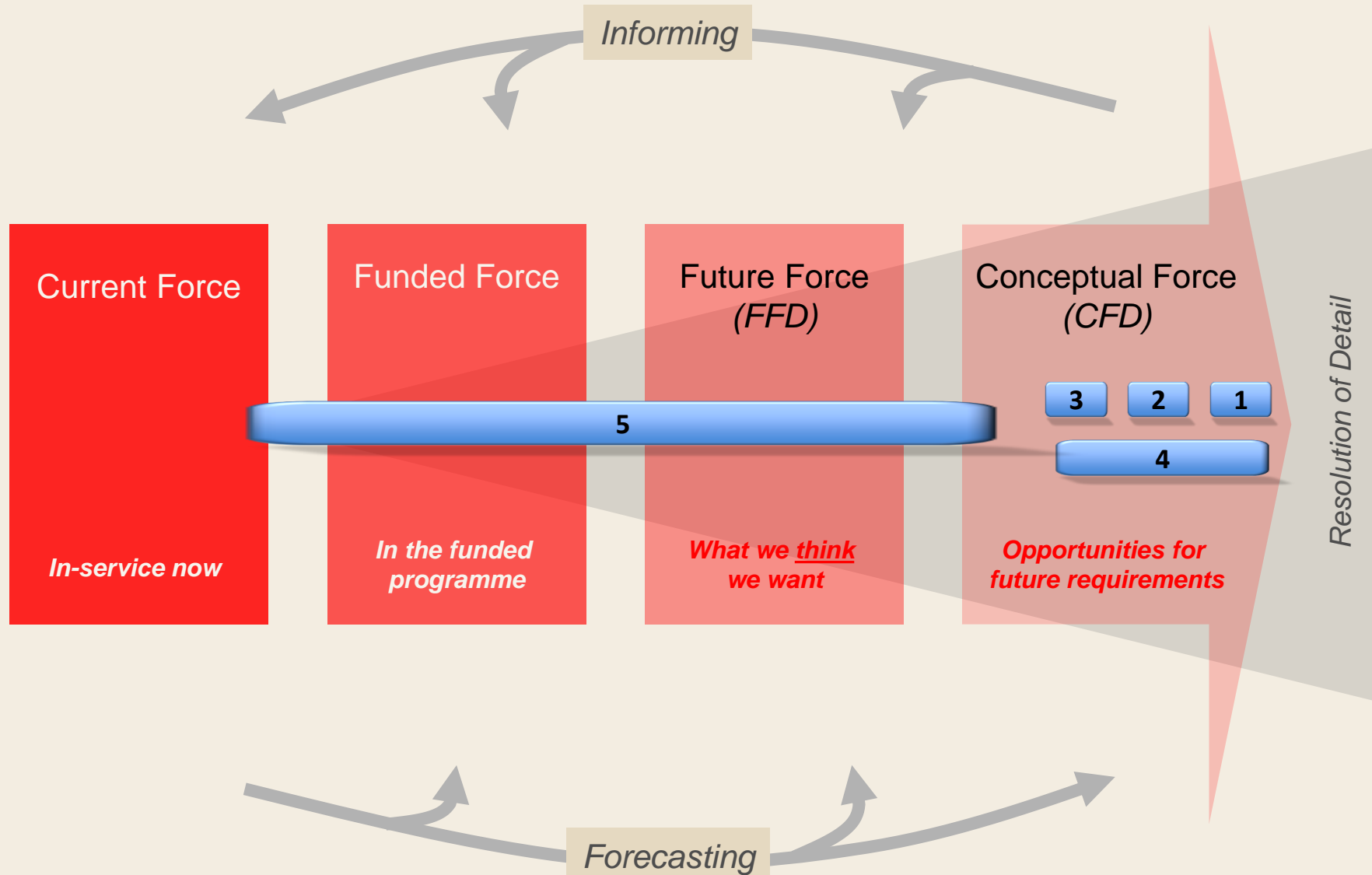
MQ 3. What capabilities will Land Forces require to deliver operational success in the future?

MQ 4. What might change?

MQ 5. What balance of affordable capabilities is required by Land Forces to deliver operational success?

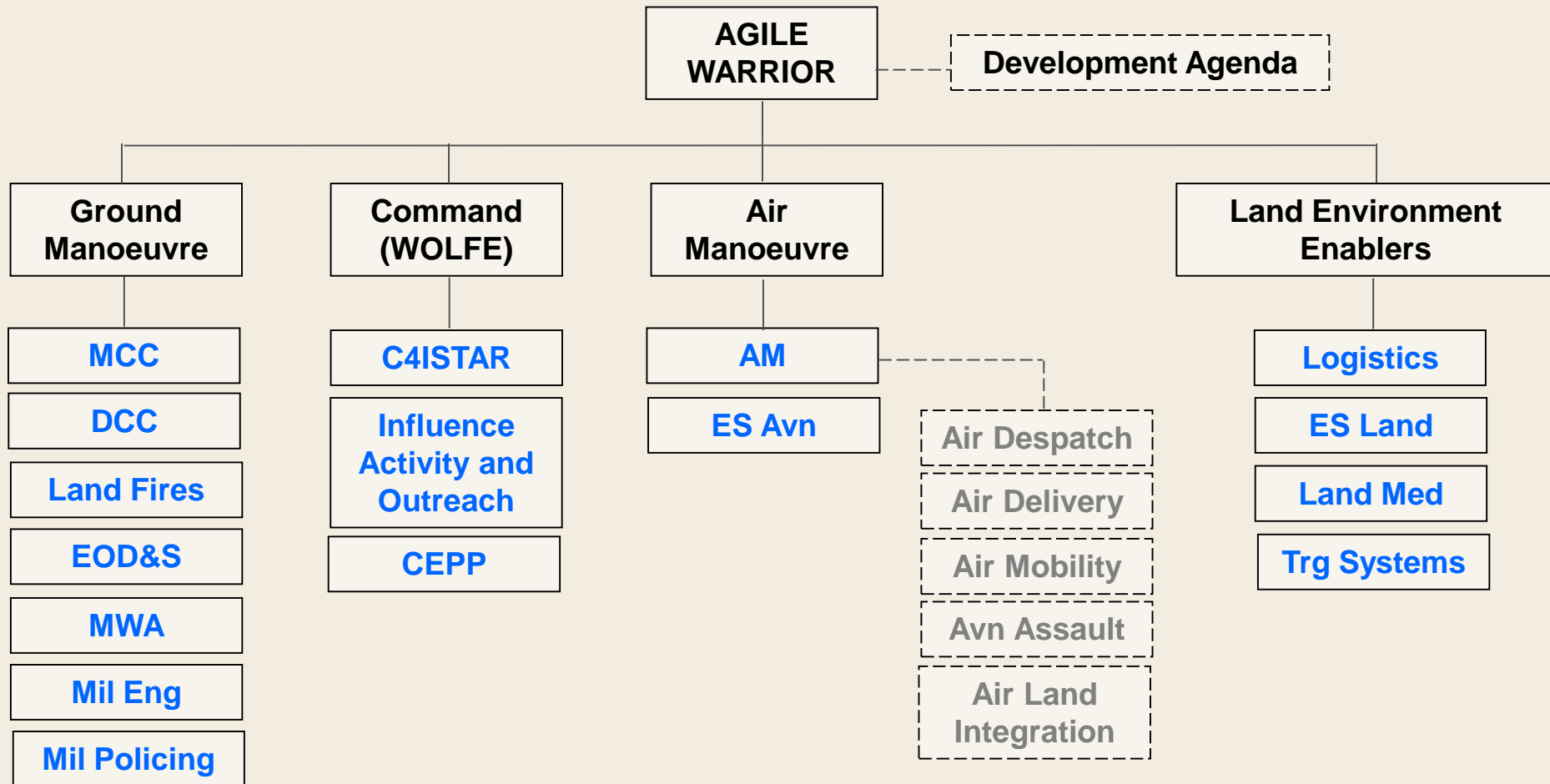


Capability Development Architecture with MQs





AGILE WARRIOR Framework



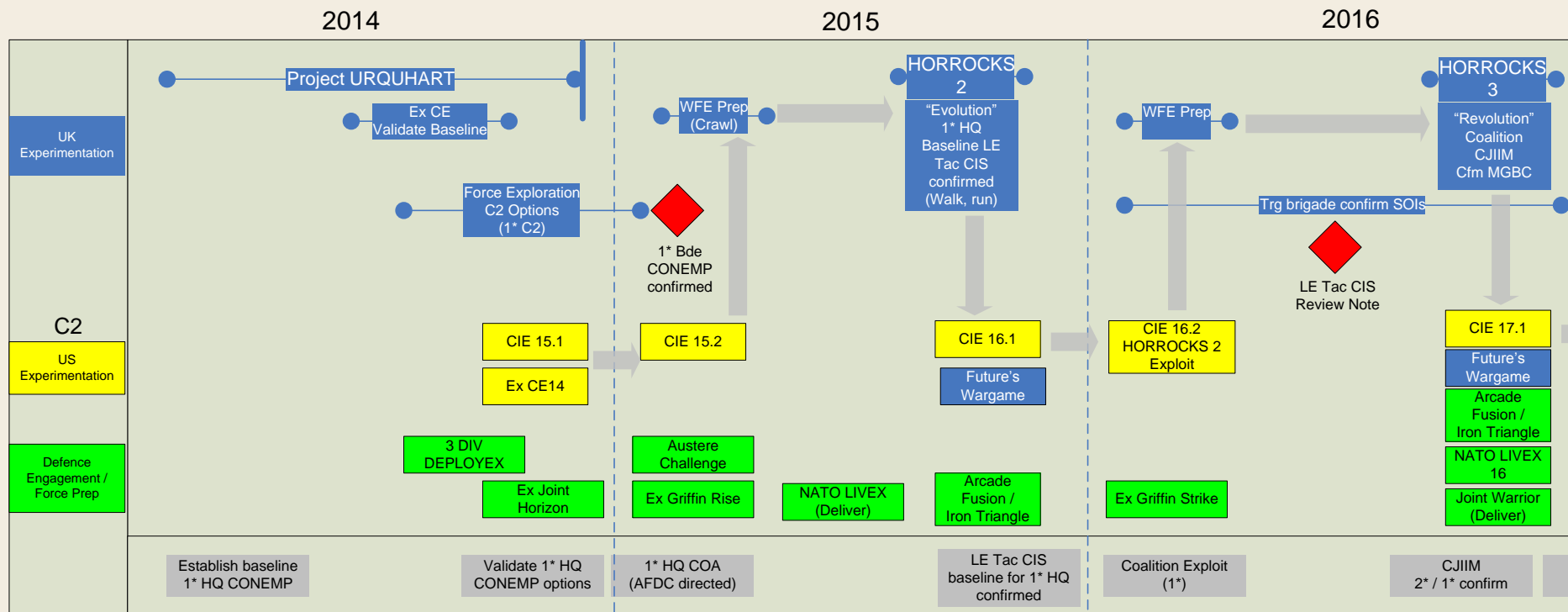
KEY

Existing Capability Planning Groups (16)

Subsidiary considerations



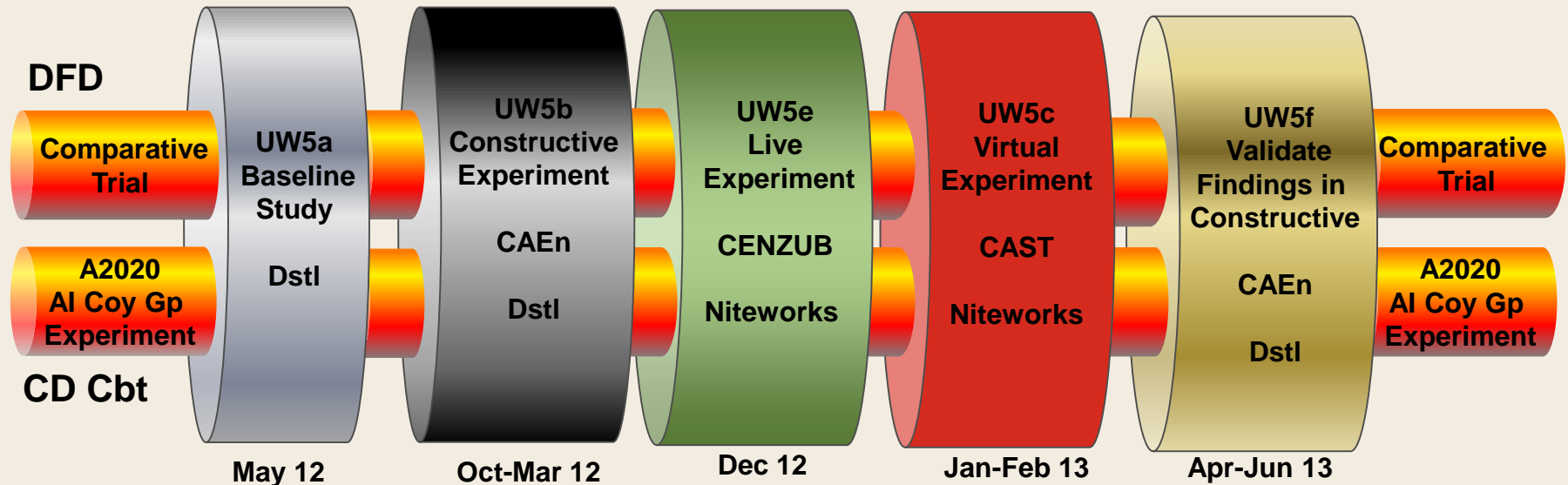
Army C2 Experimentation and Interoperability Programme





Urban Warrior 5 (2012/3)

An 'Experiment' in Experimentation



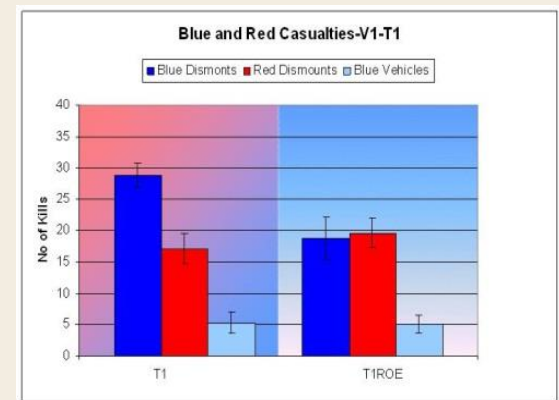
Q1 - How can Live, Virtual and Constructive (LVC) simulation methods for experimentation be used to provide complementary analysis for evidence-based decision making?

Q2 - How can the effectiveness of the AI Coy Gp in 2020 be improved for Urban Operations?



UW5 Analysis

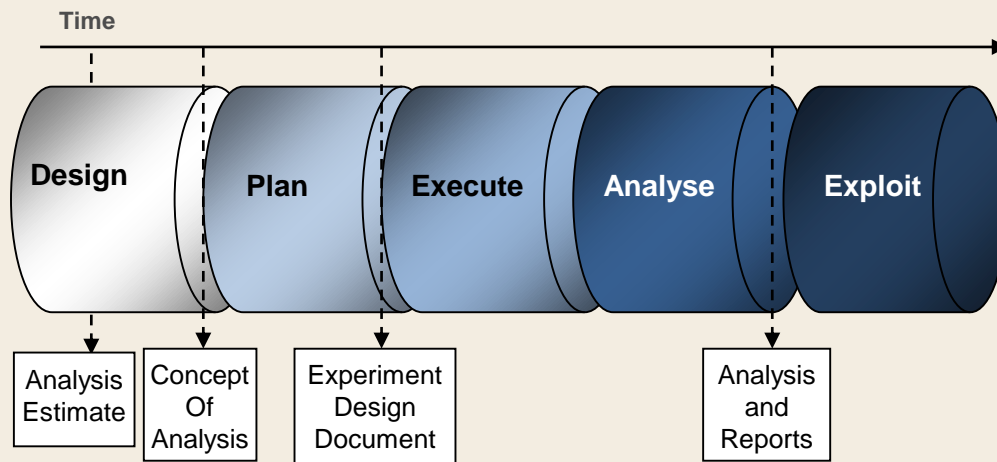
- Within the 3 simulation domains capability changes were assessed against mission effectiveness
 - Infantry mass v reduced armour v enhanced C2/SA v alternative ROEs
- Significant evidence was collected to support land capability development for urban operations
- Robustly assessing group effectiveness requires a combination of LVC methods to mitigate the inherent weaknesses of the individual simulation domains
 - Constructive – good for kinetic effect, multiple runs and experimental control
 - Live – good for representing C2/SA, human factors and operational friction
- Lessons were also learned on the A&E process, on governance, funding, timescales, etc.





Force Development Analysis & Experimentation Handbook

- Provides a practical guide for commanders, Army HQ staff and Formation/Unit staff in the design, planning and conduct of FD related A&E
- Implementing best practice





Integrated Analysis & Experimentation Campaigns

- Generating A&E campaign plans (IAECPs) for AGILE WARRIOR themes:
- What are the key Questions, their priority, and what will the output inform?
- Are they being answered already?
 - In CSA's S&T Programme
- What is the most appropriate method(s) for answering them?
- Do we need to initiate a new study to answer it?



IAECP Evidence Exploitation

Integrated A&E Campaign Plan (IAECP)

Questions > Existing Studies > Proposed Studies > Evidence

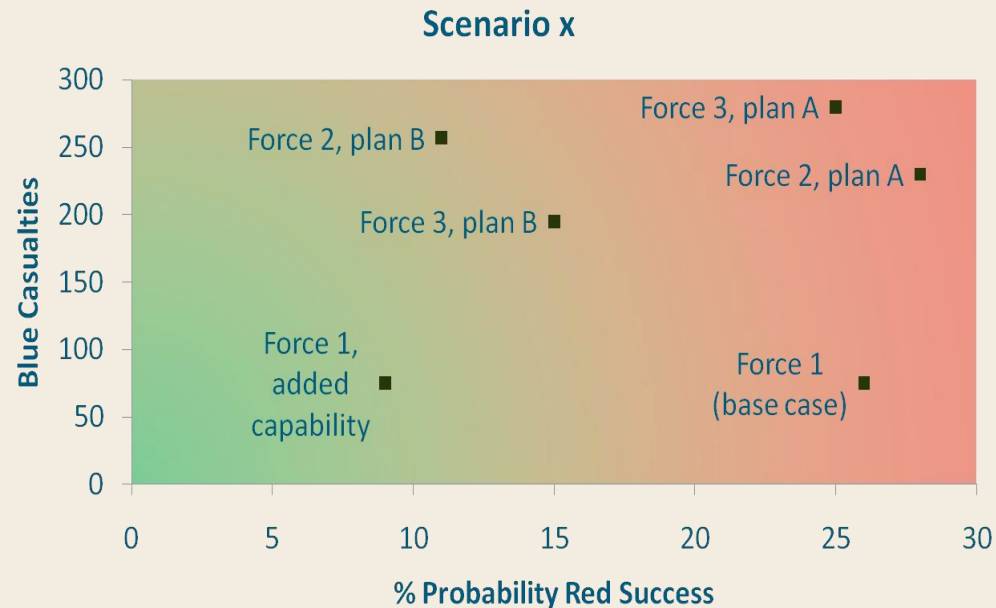
- Inform Capability Management Strategy (CMS) and Capability Management Plans (CMPs)
- Capability Bol to inform CMG decisions and Prog initiation
 - Genesis Option, IG/MG evidence of need and numbers
- Inform Concepts and Doctrine
- Inform senior Army Decision Makers (AFDC > ECAB)
- Influence defence policy (via Head Office)
- Request S&T (through Research Objectives)
- Evidence in support of the Capability Audit
- Further study > A new/revised analysis question



Land OA Steering Gp - Land OA Project

- **Force Testing** – Dstl have used a variety of simulation models to assess land capability across the policy mandated scenarios
 - Included a deployment and operational effectiveness comparison of the VHR BGs

- **Force Exploration** – these scenarios/models will now be used to address IAECF Questions





Future Land Conceptual Wargaming Cycle

- Aim - derive capability requirements beyond the funded programme within a range of plausible alternative futures

16-20 Jun

**Future Land
Operating
Environment
(FLOE)
Conference**

21-25 Jul

**Wargame
Development
Seminar**

6-17 Oct

**Conceptual FD
Wargame**

**Nov 14-
Mar 15**

**Post Wargame
Analysis**

- The outcome will be used as evidence to drive future force design





Growth areas: Wargaming and Historical Analysis

- Wargaming
 - DG Cap Strat team have undertaken a Mali game to assess capability. An Iraqi game is planned
 - 3(UK) Div recently conducted a seminar wargame on Mali and have asked for their own wargaming tool in order to assess their plans
- Historical Analysis
 - Now being used by DG Cap Concepts and Strat teams to address FD questions



Challenges for Analysis

- Land Capability Balance of Investment
 - Assessing AFVs v Aviation v Comms v Med v Logs
- Providing robust evidence to support the Army's future investment in capability
 - 2nd decade: vehicle and helicopter fleet, fires support
 - Beyond: what technologies will have the greatest impact on land combat and how?
- Establishing ICS baseline performance now in order to demonstrate the of operational benefit of LE TacCIS
- Being able to assess HQ performance in alternative ways to a major experiment/exercise
- What is the impact of investing in Defence Engagement?

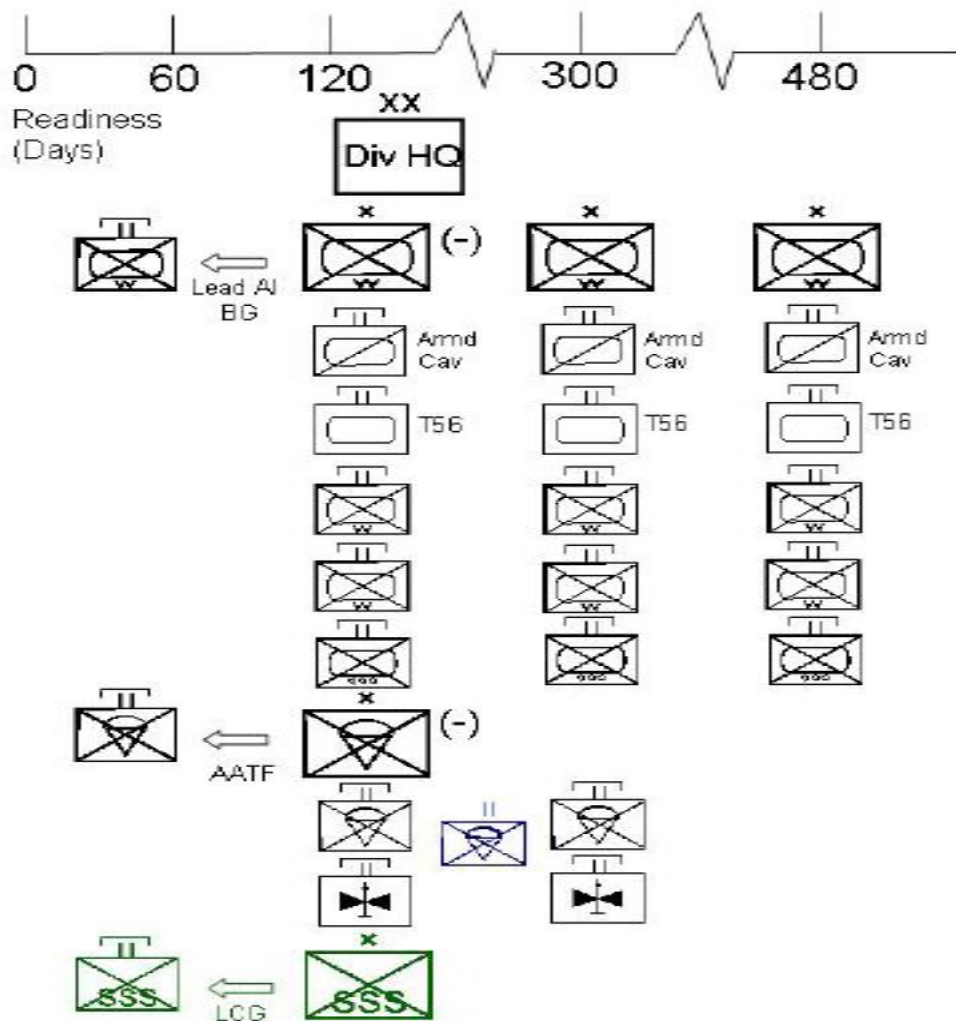


Questions



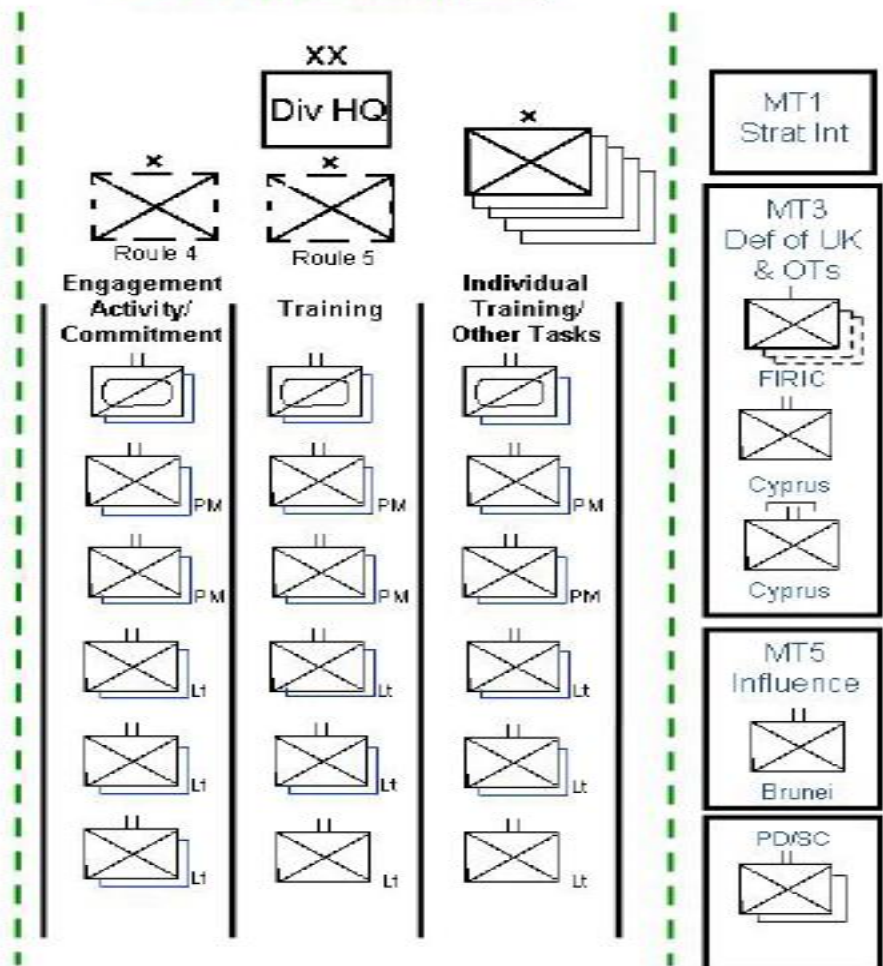
Adaptable Force

Reaction Forces



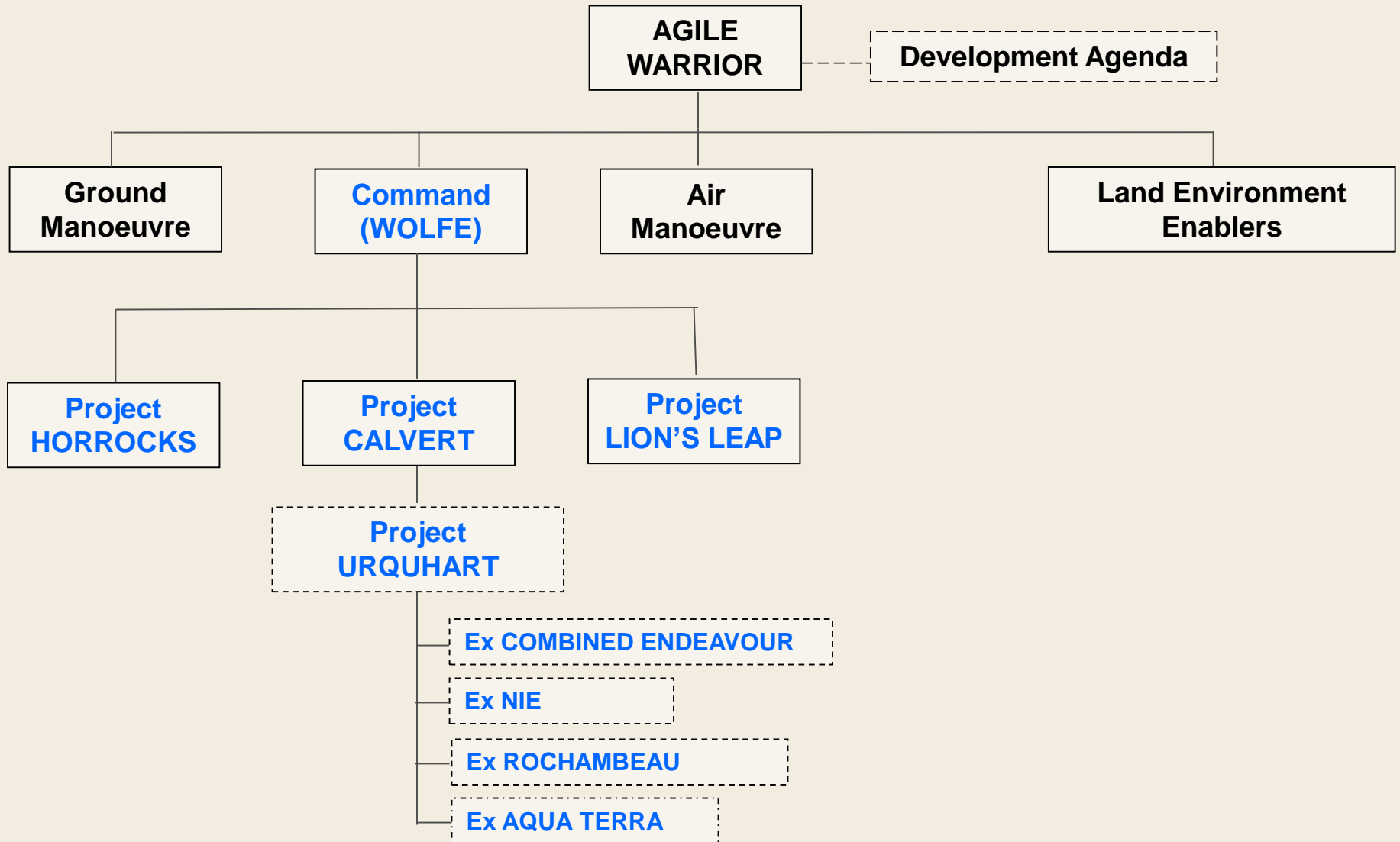
Adaptable Forces

A pool of forces to deliver (MS(E), Standing Defence engagement, UK engagement/National resilience, best effort and institutional resilience)





AGILE WARRIOR - Command





Programme Wolfe – Command and Control

HORROCKS 2014-2018

Refinement and
Implementation of
A2020 concepts

The Division

Div SOIs by Jan 14
Exploitation in FY14/15

The Brigade 2018

Bde CONEMP by Apr 14
Informs LE TACCIS

The BG 2018

CD Cbt-led BG CONEMP by
Apr 14

CALVERT 2018-2030

Force Design for Next
Decade: Brigade
After Next

Scoping Study

2014

Experimentation

2015

Underpinned by Blue Skies
Thinking and Red-Teaming
From LIONS' LEAP

LIONS' LEAP 2030-2040

Deep Concepts and
Impact of Emerging
Technologies

Scoping Study

2015

Experimentation

2016

Primacy at Bde and BG level

Ex URQUHART: 2014 Investigation into future provision of C4ISR information capabilities to support the Brigade Headquarters level and below.

Focus is the 2018-2023 timeframe with deductions informing further DFD led experimentation for 2023 and beyond



A&E Plan

2014

2015

2016

2017

C2

GM

AM

Enablers

Project URQUHART

Ex CE
Validate Baseline

Force Exploration
C2 Options
(1* C2)

CIE 15.1

Ex CE14

3 DIV
DEPLOYEX

Ex Joint
Horizon

WFE Prep
(crawl)

1* Bde
CONEMP
confirmed

CIE 15.2

Austere
Challenge

Ex Griffin Rise

HORROCKS
2
"Evolution"
1* HQ
Baseline LE
Tac CIS
confirmed
(walk, run)

CIE 16.1

Futures
Wargame

Arcade
Fusion /
Iron Triangle

WFE Prep

Trg brigade confirm SOIs

LE Tac CIS
Review Note

CIE 16.2
HORROCKS 2
Exploit

Ex Griffin Strike

HORROCKS
3
"Revolution"
Coalition
CJIM
Cm MGBC

CIE 17.1

Future's
Wargame

Arcade
Fusion /
Iron Triangle

NATO LIVEX
16

Joint Warrior
(Deliver)

Sp to WFE
Prep

Support WFE
C2 for GM

LE Tac CIS
MG BC
(2018)

Refine Medium Concept

Project
BRITTANY

Force Structure
Analysis / Comparison

WFE preparation / assessment
Force mix OA

UV IGBC
(2016 - tbc)

WFE Prep

BATUS
Armd

US / Can
Medium

BATUK
Light

III (US) CORPS
Ex

UV MGBC
(2018 - tbc)

Arcade
Fusion /
Iron Triangle

SCOUT baseline study & virtual experiment build

SCOUT virtual experiment

SCOUT exploitation: manual/constructive wargame - tbc

Direct DLOD
changes to
exploit
SCOUT
capabilities

CONGREVE initial experimentation

CONGREVE
interim
report

CONGREVE main experimentation activity

S2S Fires
Report

CONCEPTUAL
WAR GAME

Ex GALLIC
MARAUDEUR

CAESAR trial

Ex JOINT
WARRIOR 14.2

CH Sustain
IG - tbc

Ex JOINT
WARRIOR 15.1

Ex JOINT
WARRIOR 15.2

Puma Mk 2
FOC - tbc

CH Sustain
Ex JOINT
WARRIOR 16.1

Apache Mk2
MG - tbc

Ex JOINT
WARRIOR 16.2

Ex JOINT
WARRIOR 17.1

AATF/82XX
TESTEX

Med Sp Heli
(tbc)

AM LIVEX

Ex JOINT
WARRIOR 17.2

AATF/82XX
FOC
(2018)

Future BF Heli Study

Future rotorcraft concepts

Defence RW cap study

UAV/avn teaming study - tbc

Defence Op
Trg Cap (a)

EX ENDURING
SUNRISE

Live/synthetic TNA study

Future
MSHATF

BATHIC IG
tbc

COBURG IG
tbc

ALBION IG
tbc

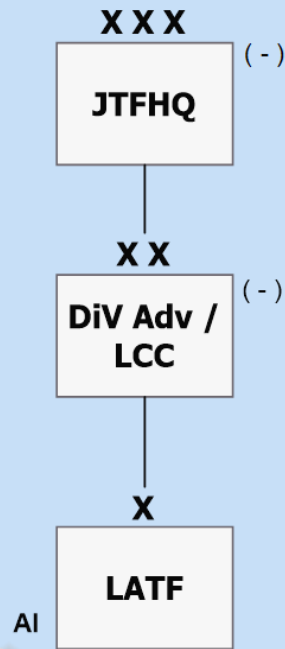
BATHIC MG
2018/19 -tbc

COBURG
MG 2018/19
- tbc

ALBION MG
2018/19 -
tbc

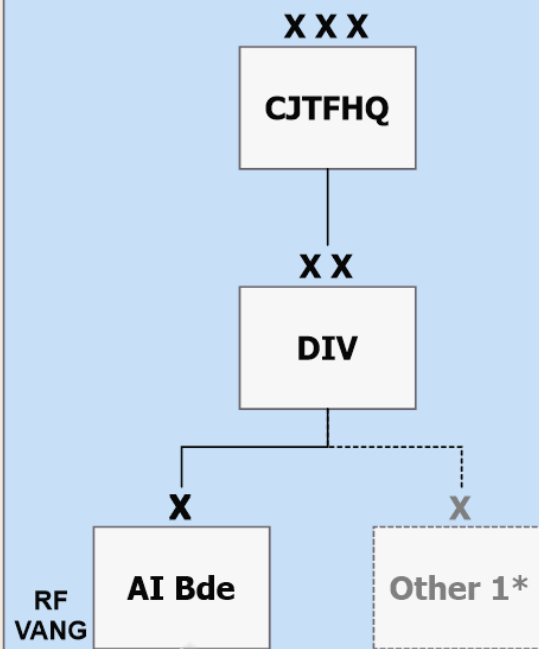
Project URQUHART: Operational C2 concepts for analysis

Model A: Focussed Intervention - LATF under Div Adv



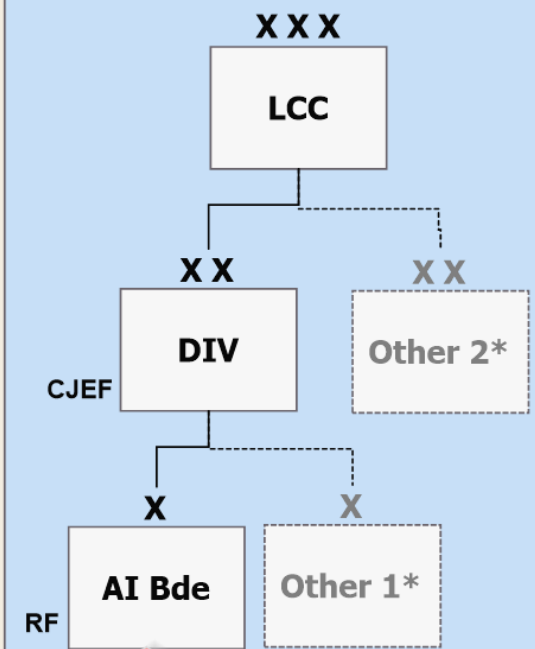
Focus
for
Analysis

Model B: Complex Intervention - AI Bde under HORROCKS Div



Focus
for
Analysis

Model C: Enduring Stabilisation - AI Bde in CJEF 2* HQ



Focus
for
Analysis





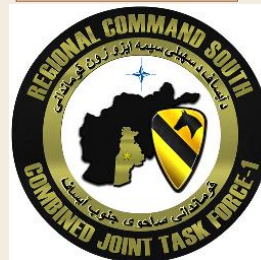
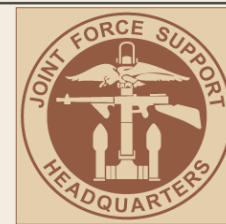
Examples: (most activities applied to both theatres)

MND (SE)

فرقة متعددة الجنسيات
(جنوب شرق)

Combat modelling
Casualty estimation
Medical bed space requirements
Logistic and movement planning
Risk from indirect fire
Risk of snipers

Campaign planning and assessment
Patrol reports and observations
Opinion polling and surveys
SIGACTS analysis
Counter IED analysis
Effect of Ramadan
SAFIRE risk to helicopters
Base closure and redeployment



RESTRICTED



Supporting Operations

- Deployed to: Bosnia, Kosovo, Italy (for Balkans and Libya), Qatar and Kuwait (for Iraq), Iraq, Afghanistan and Bahrain.
- Helped plan from UK: ops in all the above plus East Timor and Sierra Leone.
- UK Ops: fuel strike, firefighters strike & flooding.
- Over 800 individual Dstl deployments/ visits.
- Over 100 Dstl person-years in theatre.

