



# **Capability Based Operational Analysis: URBAN WARRIOR 5**

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# URBAN WARRIOR 5

- Challenge:

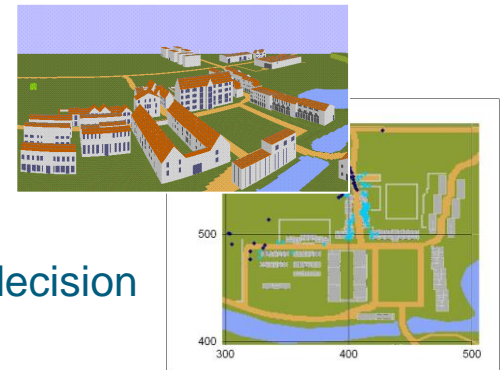
- demonstrate how complementary analyses can inform evidence-based decision making, through an investigation of AI Coy Gp effectiveness.

- Method:

- Primary DLoDs (Organisation, Doctrine and Equipment) investigated using Live, Virtual and Constructive modelling.

- Exploitation / impact:

- Army Field Manual on experimentation
- Capability development
- Understanding complexity of questions
- Demonstration of capability- and evidence- based decision support
- Clarifying strengths and limitations of experimentation methods



# UW5 Core Questions

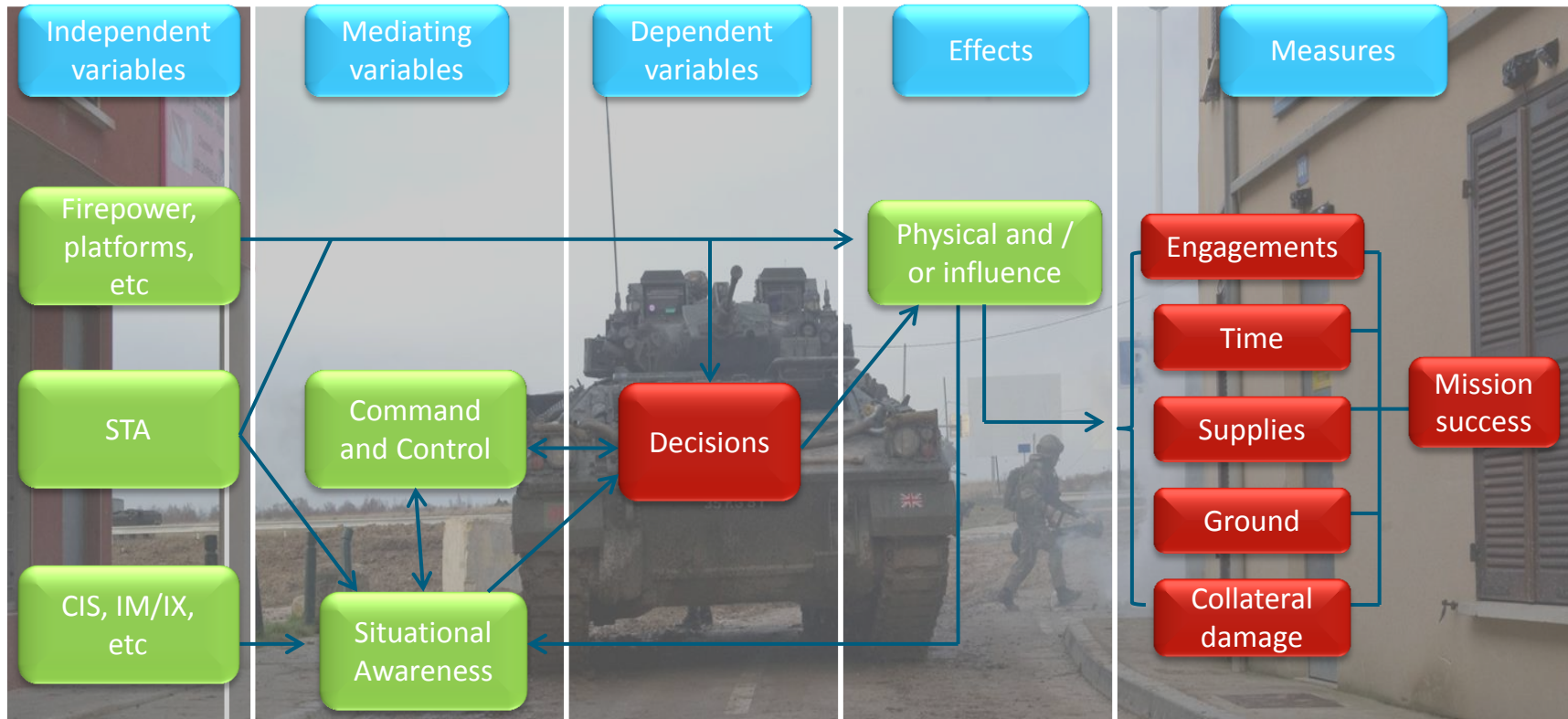
- Question 1. How can live, virtual and constructive (LVC) simulation methods for experimentation be used to provide complementary analysis for evidence-based decision making? [For DFD.]
- Question 2. How can the effectiveness of the Armoured Infantry (AI) Company Group in 2020 be improved for urban major combat operations? [For CD Cbt.]

Question 1 is to inform future Army HQ FD activities and requires a viable and credible approach to answering Q2 if the Main Effort is to be answered successfully.

# Capability Based Decision Support

- UW5a studies found that focus areas for Q2 were in improving C2 and SA at all levels of command within the AI Coy Gp.
- Analysis of Customer Questions identified other areas of interest:
  - ORBAT (alternative numbers of infantry and MBT).
  - The effect of different types of urban terrain on doctrine / TTPs.
  - IM / IX enhancements.
  - CIS and STA (and hence, C2 and SA,) enhancements.
- Army capability comprises many facets, but:
  - Can't be characterised by simply representing equipment.
  - Results from teams' Collective Performances where decision making is crucial.
  - Changes to DLODs may affect AI Coy Gp effectiveness but too many changes will result in poorly controlled experimentation (and a lack of conclusive evidence as a consequence).

# Capability Based Decision Support



# Capability Based Decision Support

- OA methods have different strengths and weaknesses:
  - no single method / technique covers all facets of Army capability;
  - ‘campaigning’ approach needed using combinations of techniques to allow weaknesses of one method to be compensated for by the strengths of another i.e. an Integrated Analysis and Experimentation Campaign (IAEC);
  - strengths from all methods need to be combined in culminating investigation.

## Constructive (eg CAEn)

Good: kinetic effect.

Good: future scenarios and capability options.

Good: experimental control.

Good: multiple runs

Poor: CP, C2 / SA, integration, and operational friction.

Tactical functions and ODE explored via wargames.

Low relative cost, fast to develop, not resource intensive.

## Virtual (eg VBS2)

OK-ish: kinetic effect.

Good: future scenarios and capability options.

Good: CP, C2 / SA, ODE, and integration issues.

OK: element of friction via SE immersion

OK: experimental control

Multiple runs are not easy to achieve.

Higher cost, slower to develop, can be resource intensive.

## Live (eg CENZUB/TES)

Good: CP, C2 / SA, ODE, Human Factors, and integration issues.

Good: operational friction

Poor: kinetic effects

Poor: future scenarios and capability options.

Poor: experimental control.

Difficult to do multiple runs.

Highest cost, slowest to develop, is resource intensive.

# UW5 IAEC



## Develop data & assumptions:

Armr, inf, CIS & STA for MCO  
Baseline ORBAT, TTPs, JFs etc.

Oct-Nov

**5b Constructive**

## MODEL (Wargame & Simulation)

Test baseline ORBAT and TTPs.  
Vary ORBAT & TTPs (MBT & inf nos).

Dec '12

**5e Live**

## Warfighting EXPERIMENT:

Test baseline ORBAT & TTPs.  
Vary ORBAT, TTP, & limited CIS / STA enhancements.

Jan '13

**5c Virtual**

## Warfighting EXPERIMENT:

Test baseline ORBAT & TTPs.  
Vary CIS, STA, IM/IX across ODE.

Apr-Jun '13

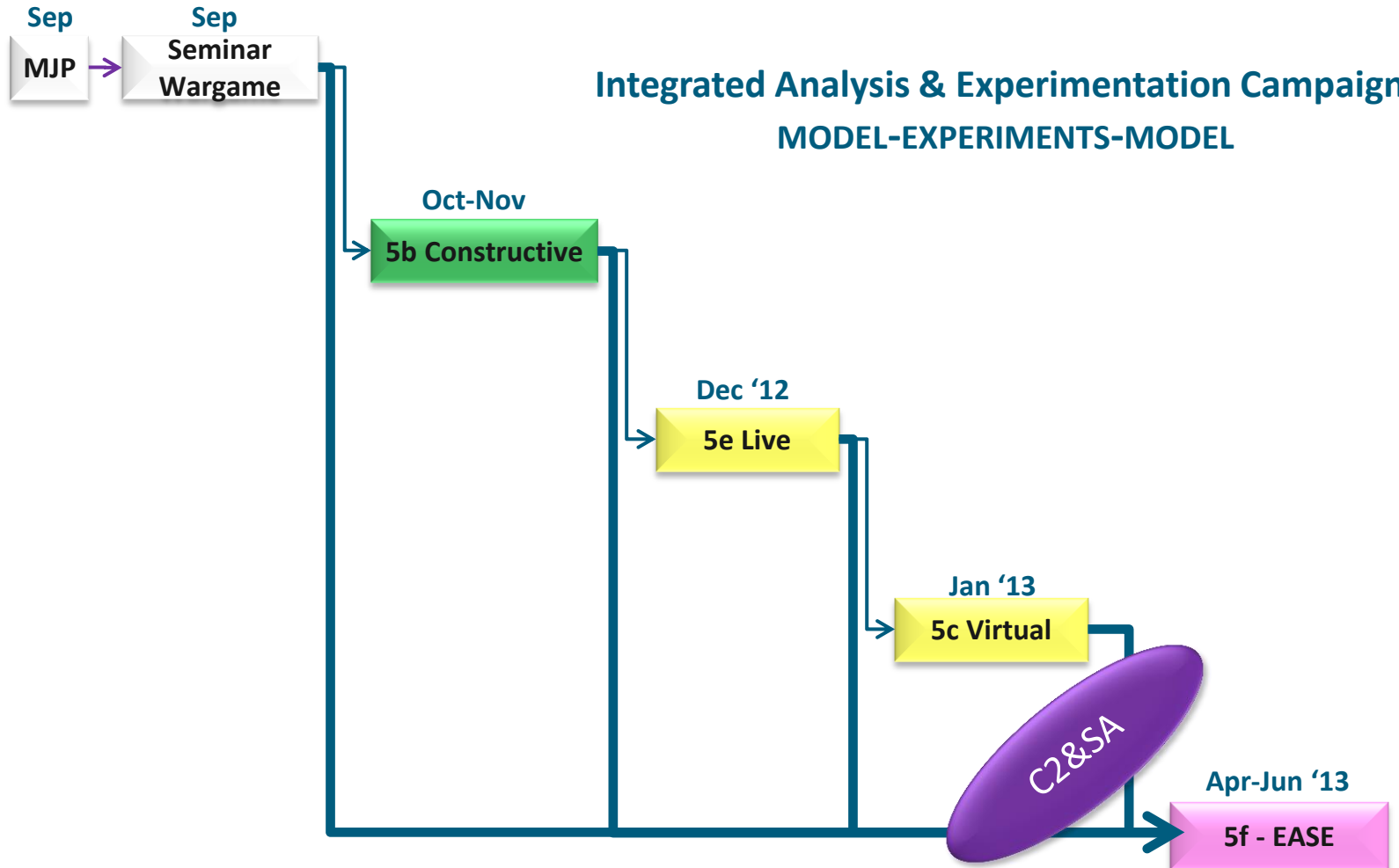
**5f - EASE**

## MODEL (Enhanced Analysis & Simulation Environment):

### Abbreviations:

CIS – Command Information Systems  
Eqpt – Equipment  
JFs – Joint Fires  
Loc - Location  
ODE – Organisation, Doctrine & Equipment DLODs  
ORBAT – Order of Battle  
Org - Organisation  
STA – Surveillance & Target Acquisition  
TTP – Tactics, Techniques & Procedures  
wrt – with respect to

# UW5 IAEC

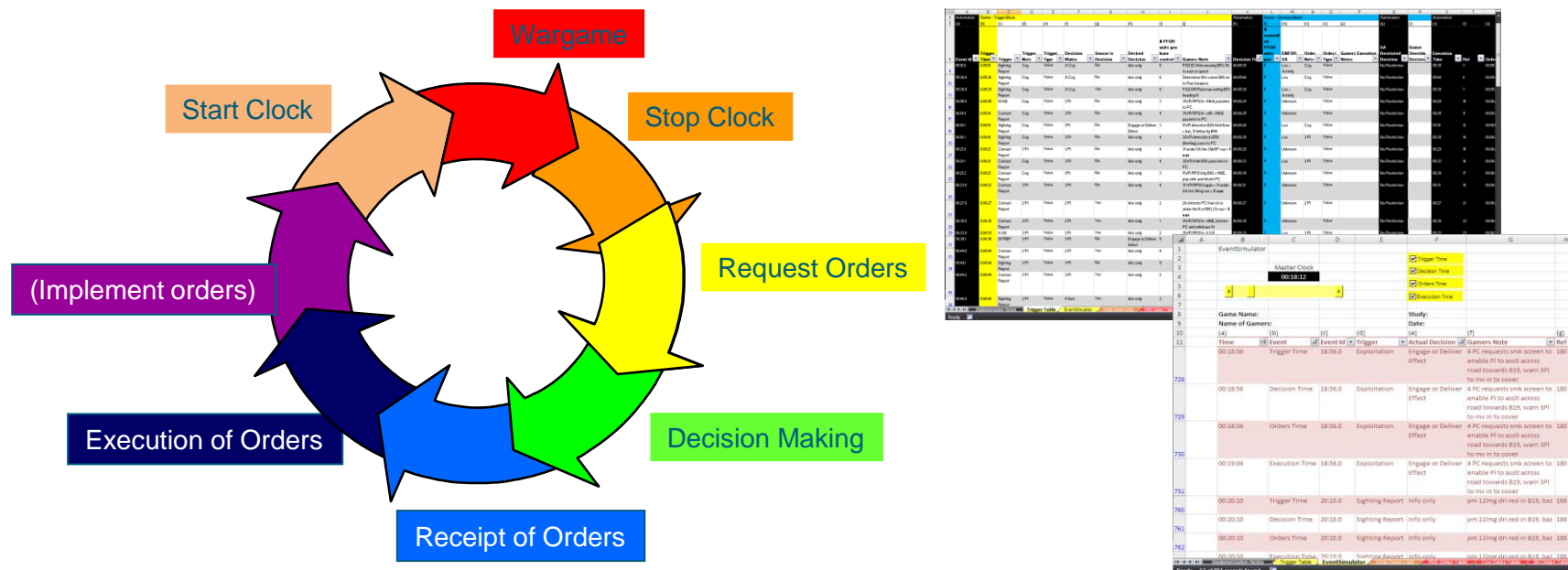


- Each activity contributes evidence and insights.
- Final activity also assesses improvements on a holistic, capability basis.
- **Only by drawing upon all activities, culminating in EASE, can UW5 ME be achieved**



# Incorporation of C2&SA Information

- C2&SA Protocol Tool developed by Roke Manor:
  - Insights and data from a variety of sources used;
  - (Constructive) modelling provides mission context;
  - Workload and network modelling calculates time delays;
  - Provides an automated C2 &SA Future Event Ring.



# Summary

- All aspects of capability need to be investigated to ensure correct representation:
  - cannot assume that non-tracked variables are constant.
- No single OA method adequately covers all aspects of capability:
  - combination of techniques required and/or intelligent assumptions made.
- An Integrated Analysis and Experimentation Campaign plan should be established to link and inform investigation components, building on:
  - TTCP GUIDEx
  - NATO CoBP for C2
- Strengths from all methods need to be combined in a culminating investigation:
  - compensating for inherent weaknesses and exposing limiting factors.
- Lessons identified in previous work need to be re-learnt:
  - Eg King's Ride, Big Picture.
- As a result of this study, work on an evidence framework is being pursued.

# Acknowledgements

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  - Capability Directorate Combat (CD Cbt, UK MoD)
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  - Roke Manor
  - Niteworks
  - SAAB

**[dstl]**

**Questions?**