

*To provide a national focus for science and technology to  
enhance Australia's counter-terrorism capabilities*<sup>1</sup>

# Modelling & Simulation for National Security

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# Who is responsible for counter-terrorism in Australia?

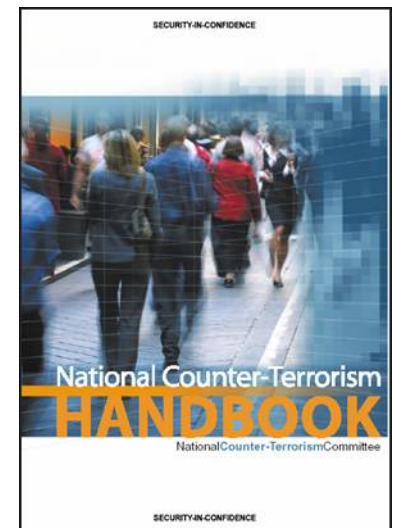
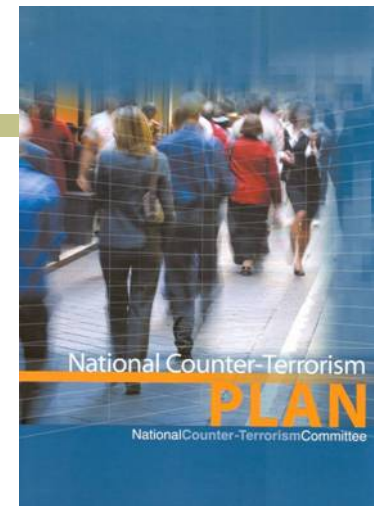
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- Australian Government departments and agencies
  - Prime Minister, Attorney General, Police, Intelligence, Transport, Customs, Defence, Health, Agriculture, ...
- State and Territory Government departments and agencies
  - Premiers, police, emergency management, health...
- Private sector
  - Transport operators, mass gathering centres, energy, water...



# Counter-terrorism coordination

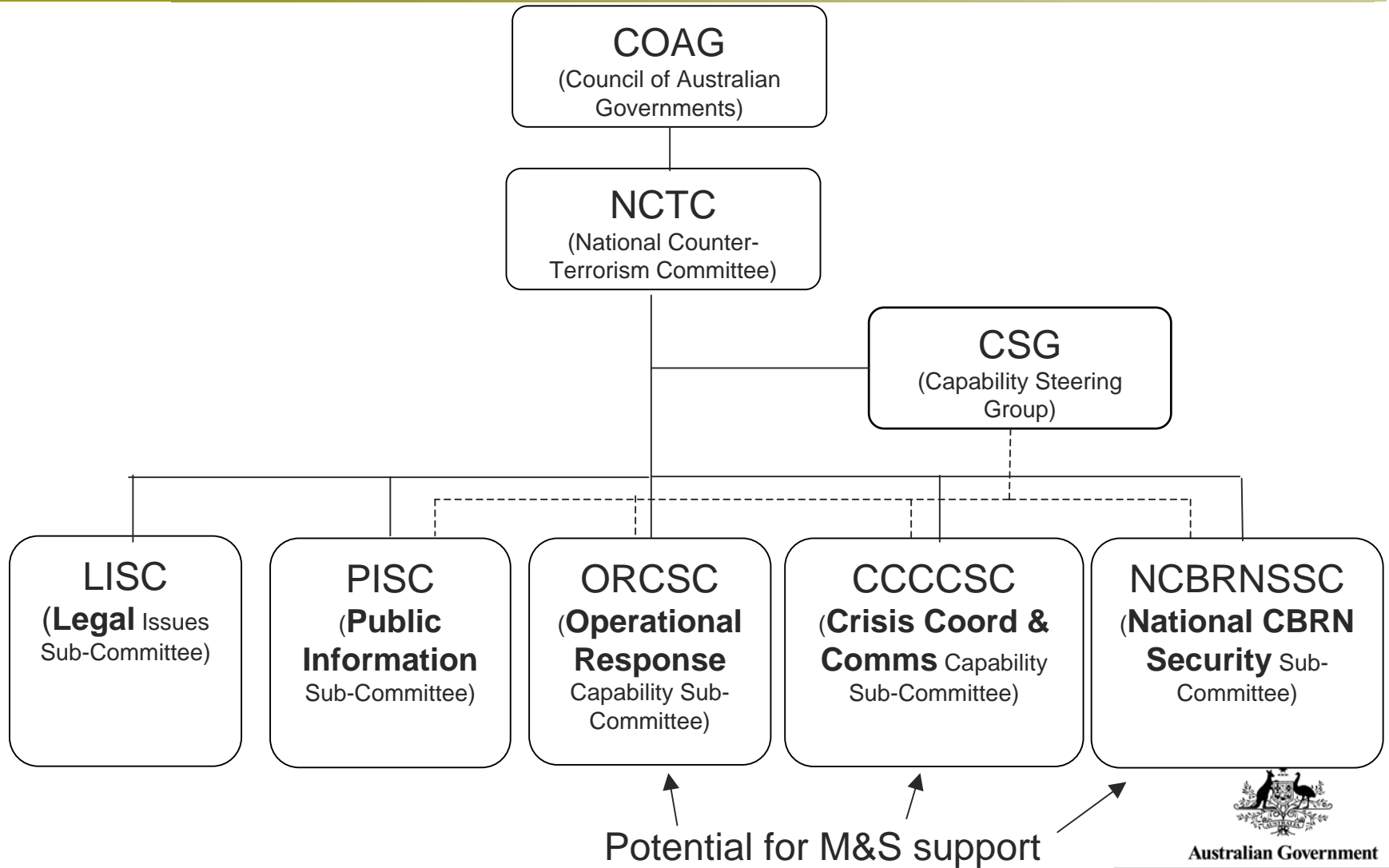
- Relies on strong cooperative, coordinated and consultative relationships
- PM&C central whole-of-government policy coordination role
  - co-chairs National Counter-Terrorism Committee (NCTC)
  - NCTC has no operational role
- Protective Security Coordination Centre (PSCC) central whole-of-government operational coordination role
- High level of cooperation and coordination required between PSCC and PM&C



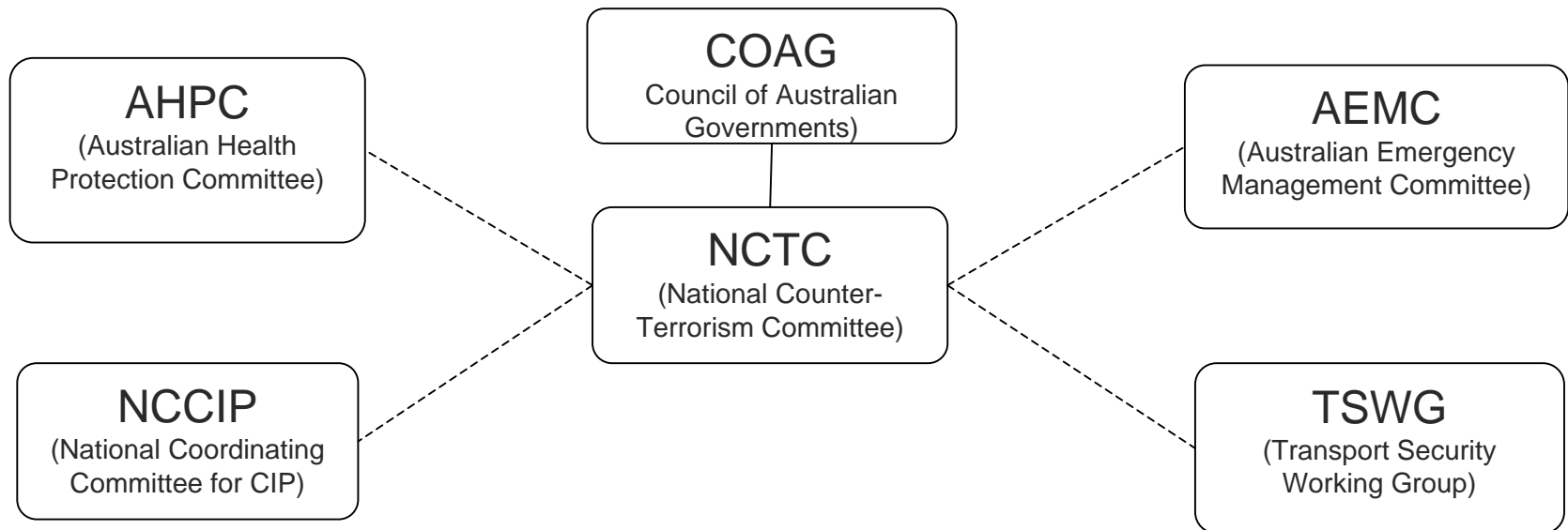
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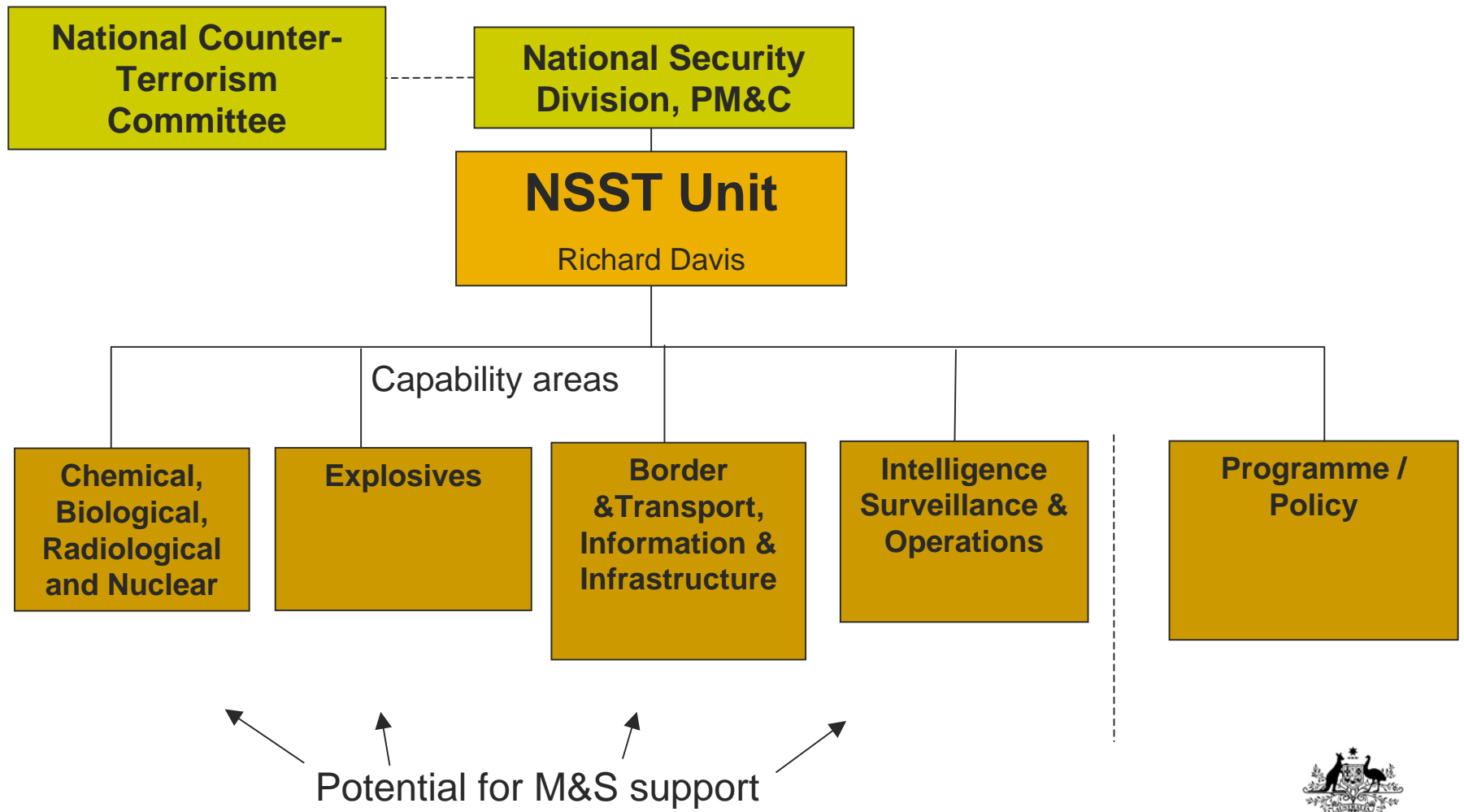
# NCTC GOVERNANCE ARRANGEMENTS



# NATIONAL SECURITY COORDINATION STRUCTURES



# NSST Unit Structure and Governance



# NSST Overview

•CBRN				
•Explosives				
•Border & Transport, Information & Infrastructure				
•Intelligence, Surveillance & Ops				

- International
- Research Support for Counter Terrorism
- Publicly funded Agencies Collaborative Counter Terrorism
- Capability
- Policy



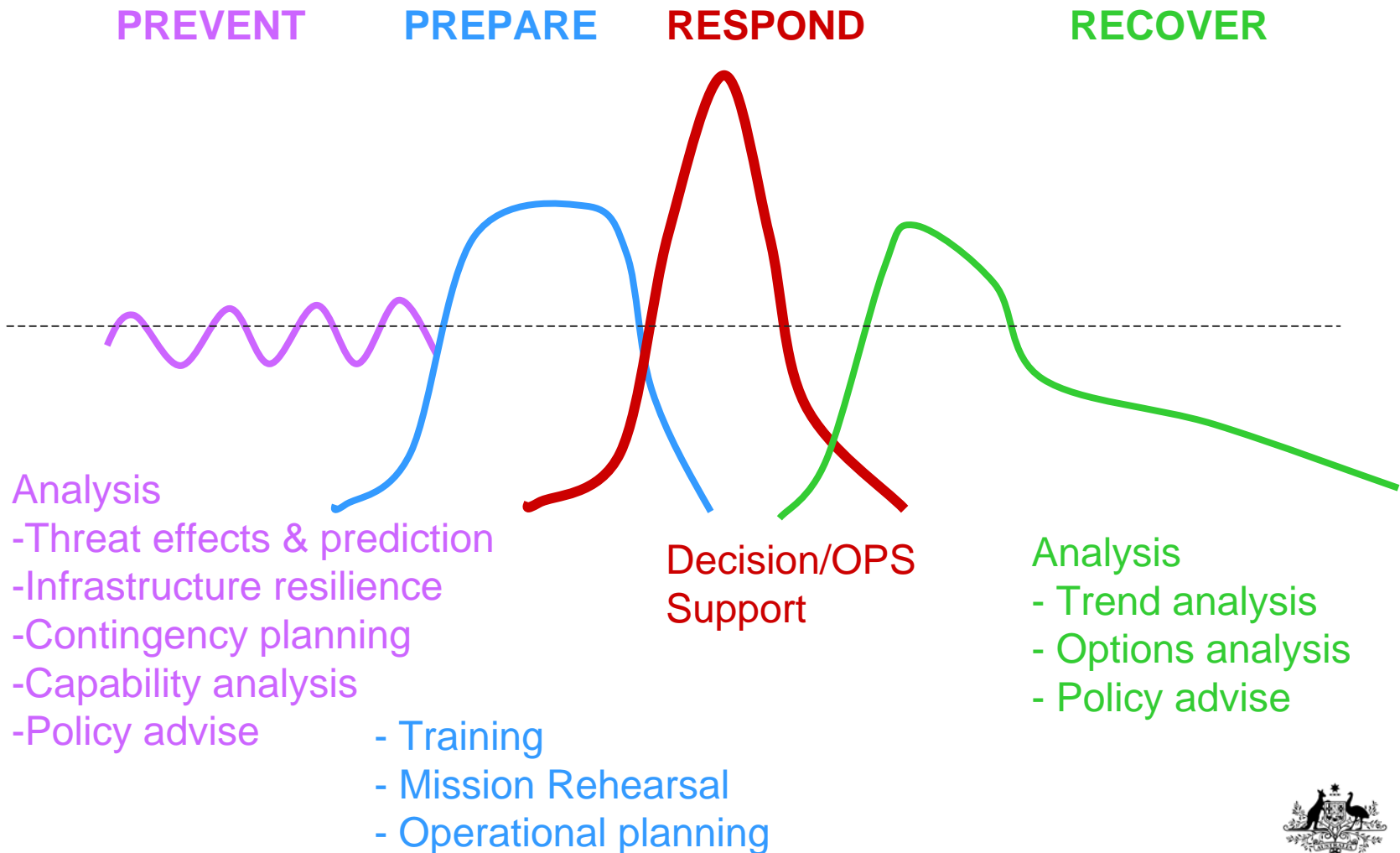
- User agencies
- Federal & State/Territory
  - NCTC oversight

- Provider agencies
- Industry
  - Academia
  - Government

CT Community



# M&S support to the four phases



# Capability Framework



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# R&D Capability Framework – 2007

Capability Requirement		Prevention	Preparedness	Response	Recovery	
Chemical, Biological, Radiological, Nuclear and Explosives	Detection / identification					
	Protection (people and equipment)		<b>The threat space</b>			
	Inspect, render safe, mitigate devices					
	Decontamination & restoration					
	Threat and effects analysis					
	Human health & social wellbeing					
	Forensic analysis					
Border, Transport, Infrastructure & Information	Critical infrastructure sectors		<b>The consequence domains</b>			
	Infrastructure interdependencies					
	Information infrastructure					
	Identity confirmation					
	Aviation					
	Maritime & supply chain					
	Surface transport & and mass gatherings					
Intelligence, Surveillance and Operations	Intelligence collection, analysis, dissemination		<b>The coordinated action space</b>			
	Smart surveillance					
	Command, control, communications interoperability, evaluation					
	Tactical response support					
	Sociological and human aspects of terrorism					
	Investigative & Forensic Analysis					



# R&D Capability Framework – 2007, M&S opportunities

Capability Requirement		Prevention	Preparedness	Response	Recovery
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# Research Support to Counter Terrorism (RSCT)



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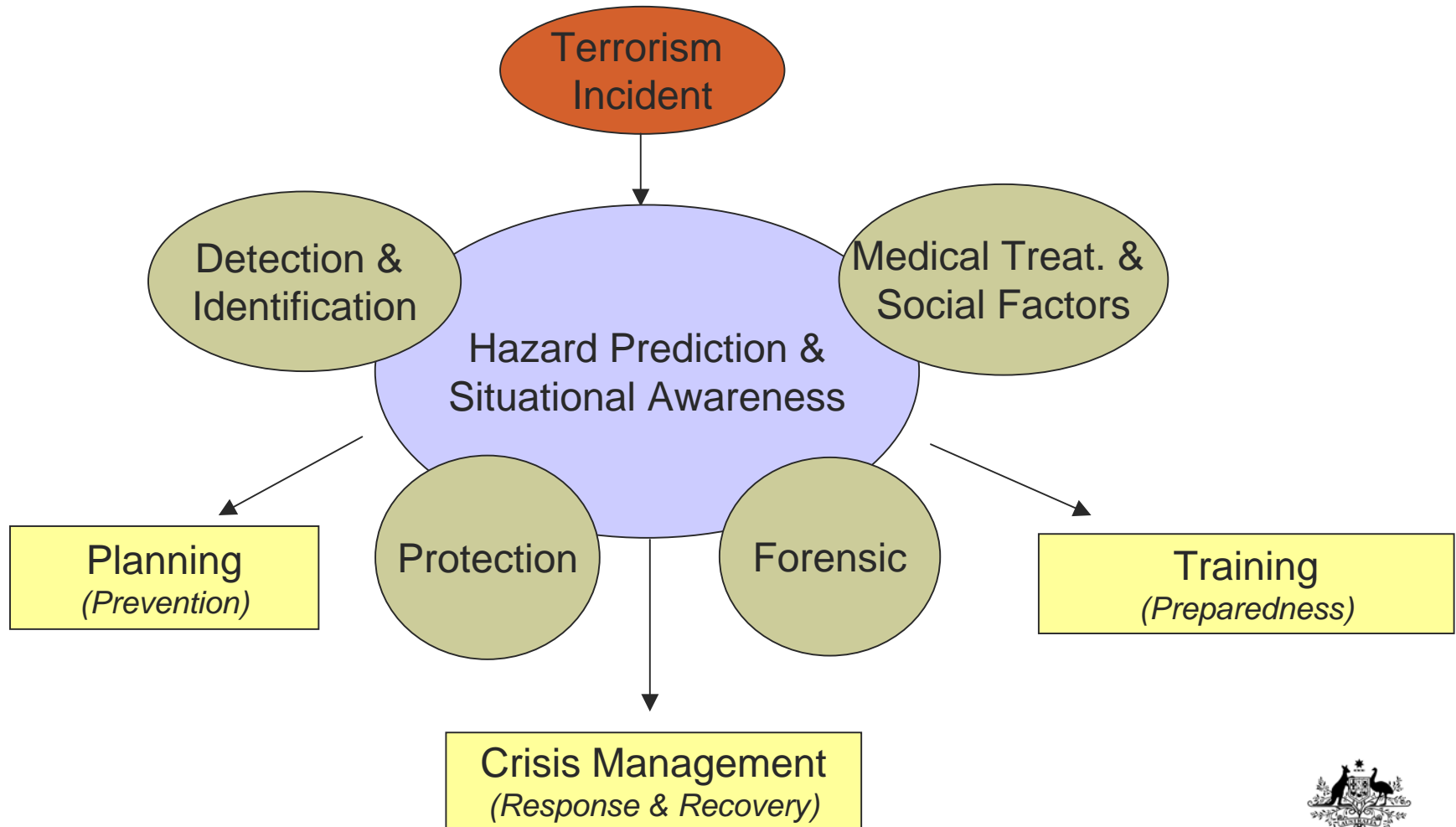
# Research Support for Counter-Terrorism Programme

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- Initially \$7.2M over four years 2004/05 -> 2007/08
- Budget Update, \$5M per annum starting in 2007/08
  - Includes ~\$1.4 M per annum for international collaborative projects
  - Co-investment leverage - \$10-15M/year equivalent
- Initial short term focus, now include some medium term
- Seek multi-agency contributions – highlights priority
- Current call for proposals, ~40 full proposals requested
  
- To date 40 Projects, approx value = \$23M



# CBRN M&S



# Critical Features

## Plume Model:

Large scale area

- Hot, warm, cold zone
- Extent of doses
- Evacuations



## Urban Dispersion:

Local area



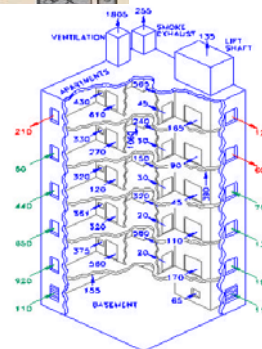
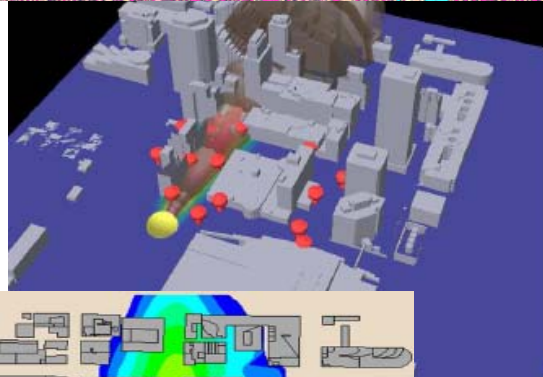
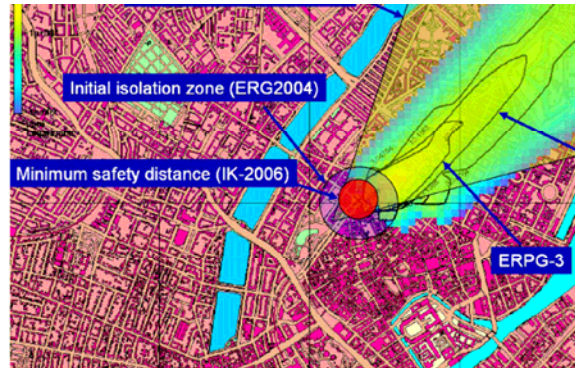
How does agent move between inside & outside

- Protect in place strategy



How does agent move Inside building

- Safe zones/evacuation routes



# Projects

- Evaluation of ARGOS DSS
- Radiological modelling and situational awareness
- CCAM/HPAC Hazard Prediction
- Real-time monitoring of bio-incidents
- DSS tools for Population Behaviour during CBRN Events
- Countermeasures for Contamination of Urban Water Supplies
- Protect-in-Place Strategies in the Event of a Chemical Release
- Vulnerability of Indoor Air to Airborne Threats Released inside a building



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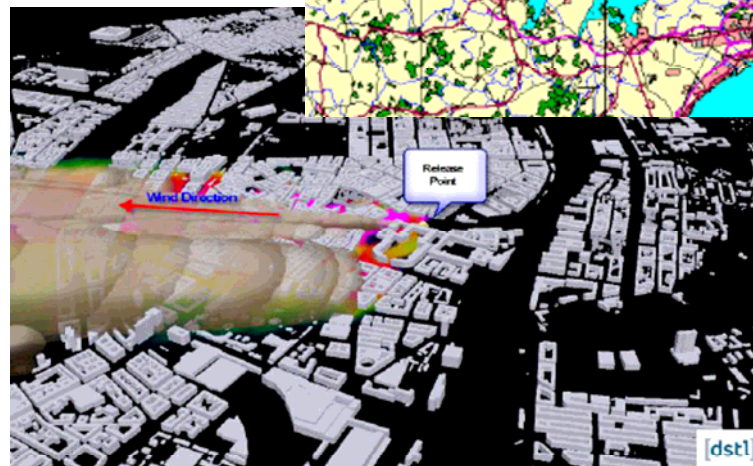
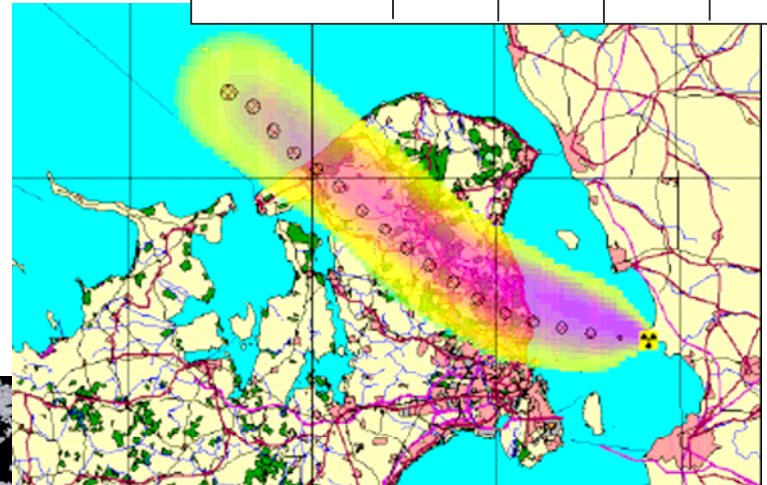
Department of the Prime Minister and Cabinet

# ARGOS DSS for Emergency Management

	P	P	R	R
CB RN E		○		
BT II				
INT OPS			○	

## Project details:

- Commence - May 2007
- Duration - 2 years.
- Partners:
  - ARPANSA;
  - Emergency Management Australia;
  - ANSTO
  - CBRN Data Centre
  - Chemistry Centre WA



# ARGOS DSS for Emergency Management

## Background:

Danish developed system for Nuclear accidents

- Extended to Chem, Bio and Rad

Managed through a consortium

- Australia, Canada, Denmark, Estonia, Ireland, Lithuania, Norway, Poland, Sweden.

## Features

- Visualisation of current and future situational awareness
- Atmospheric and urban modelling, real time data input, databases, dose calculations, interoperability, public communication.

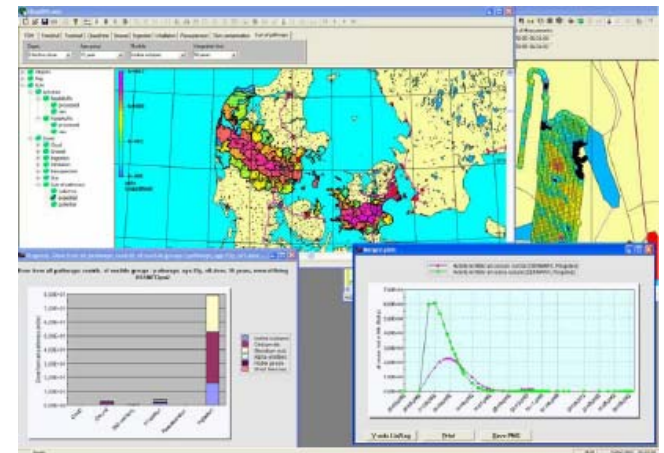


Figure 20 ARGOS Food Dose Modelling following a nuclear accident



# Critical Infrastructure protection Modelling & Analysis (CIPMA)\*

	P	P	R	R
CB				
RN				
E				
BT				
II				
INT				
OPS				

- Strengthen national security and better protect our critical infrastructure – AGD lead.
- Model and simulate the behaviour and dependency relationships of critical infrastructure systems.
- Includes a series of impact models to analyse the effects of a disruption to critical infrastructure services.
- The impact models will assess the flow on consequences of a critical infrastructure service disruption within and across sectors, the economic impacts of the disruption, the effects on population, time/duration and area of the disruption, and the behaviour of networks and clusters of infrastructure as a result of the service interruption.

\* Not a RSCT project



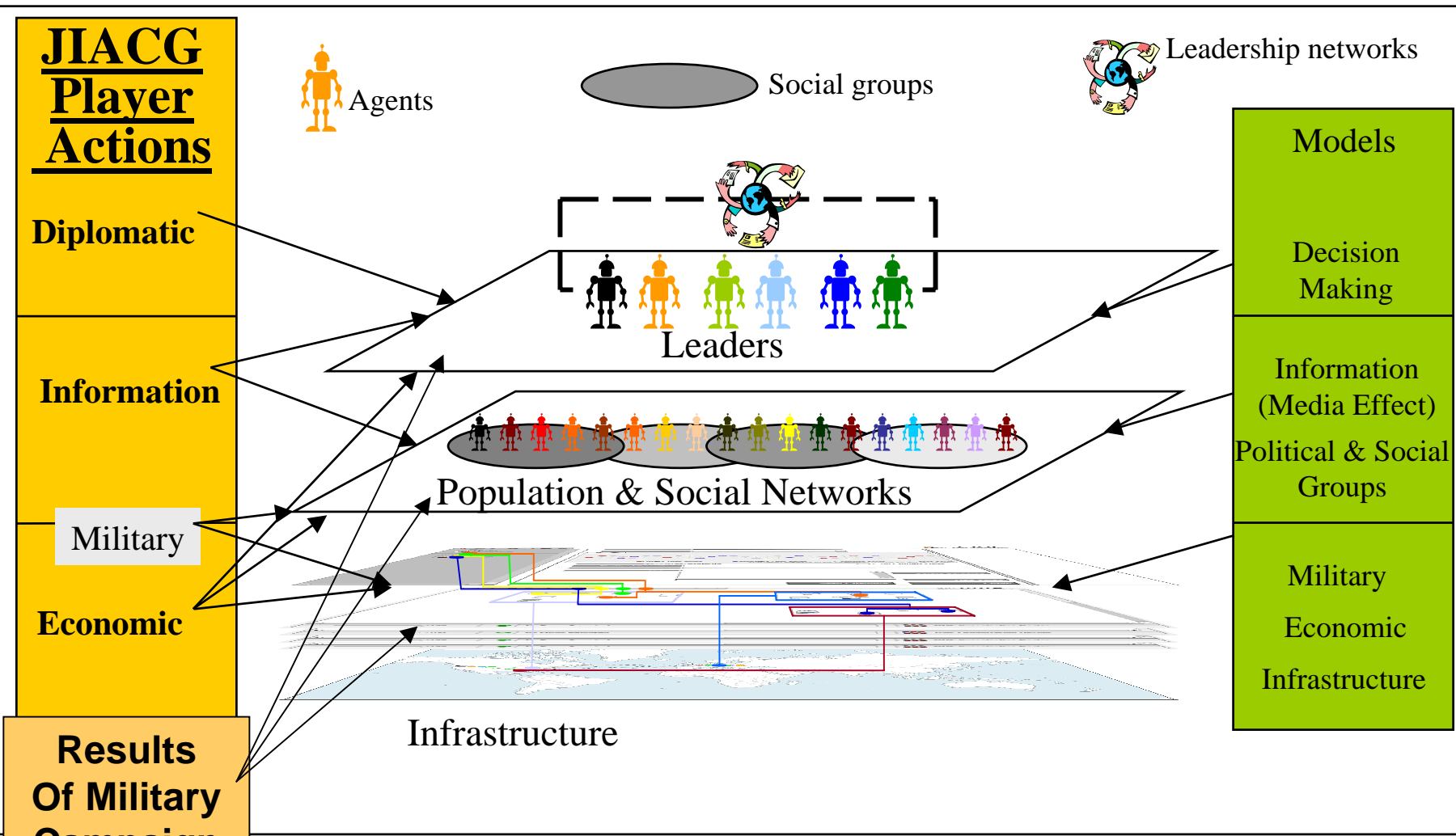
# Social modelling

	P	P	R	R
CB RN E				
BT II				
INT OPS				

- Intelligence analysis
- Social resilience and confidence modelling
- Crowd control



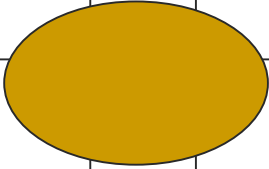
# Synthetic Environment for Analysis and Simulation (SEAS): Agent-Based - System of Systems\*



Artificial agents are pieces of software programmed with behavioral rules for interacting with each other, the environment, and for accumulating information that changes interaction possibilities.

\* Not a RSCT project

# Blast Effects – example tools\*

	P	P	R	R
CB RN E				
BT II				
INT OPS				

\* Not RSCT projects

- ConWep
  - Conventional Weapons Effects
- BEEM
  - Blast Effects Estimation Model
- HAZL
  - Window Fragment Hazard Level Analysis
- WinDAS
  - Window Design and Analysis Software



# Conclusions

	P	P	R	R
CB				
RN				
E				
BT				
II				
INT				
OPS				

- Huge potential for M&S
  - Market not yet mature
- Integration & Interoperability will become issues
- Research
  - Analytical emphasis, tactical & operational, policy input
- Technology/products
  - Simulation for training, tactical
- Build upon the existing government and industry structures to promote the capability
- Support formation of National Security M&S SIG



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## Further information:

- NSST Unit Website (just Google “NSST” or “NSST Unit”)  
<http://www.pmc.gov.au/nsst>
- National Security Website  
<http://www.nationalsecurity.gov.au>
- *Protecting Australia Against Terrorism*  
[http://www.dpmc.gov.au/publications/protecting\\_australia/index.htm](http://www.dpmc.gov.au/publications/protecting_australia/index.htm)
- *About PM&C*  
<http://www.pmc.gov.au>

Thank you



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