

# Guide to Capability-Based Planning

The Technical Cooperation Program  
Joint Systems and Analysis Group  
Technical Panel 3



## 1 Background

Each nation within the Technical Cooperation Program (TTCP) is implementing a Capability-Based Planning (CBP) system for long-term force structure planning. Due to differences in organizational, planning and legislative processes, each nation is implementing its own variant of CBP. While there are strong similarities between these variants, there are also significant differences. Because of this, the Joint Concepts and Analysis Panel of the Joint Systems and Analysis Group in TTCP decided to develop a guide to capability-based planning that would describe the core concept behind Capability-Based Planning. The aim of the guide is to provide a common understanding of CBP and establish some principles for its use.

## 2 Aim

This guide will highlight the general principles in introducing and using CBP. It will discuss the key issues surrounding CBP and ways of addressing some of these issues.

### Definition of Capability-Based Planning

*“This method involves a functional analysis of operational requirements. Capabilities are identified based on the tasks required... Once the required capability inventory is defined, the most cost effective and efficient options<sup>1</sup> to satisfy the requirements are sought.”*

Handbook in Long Term Defense Planning [1]

*“Planning, under uncertainty, to provide capabilities suitable for a wide range of modern-day challenges and circumstances while working within an economic framework that necessitates choice.”*

Analytic Architecture for Capabilities-Based Planning, Mission-System Analysis, and Transformation, Paul K. Davis (monograph)[2]

## 3 Introduction to Capability-Based Planning

Capability-Based Planning (CBP) was developed as an alternative to threat-based planning. It represents an attempt to break down traditional stovepipes and provide for transparency and coherence. CBP provides a more rational basis for making decisions on future acquisitions, and makes planning more responsive to uncertainty, economic constraints and risk. CBP provides a framework to support analysis and facilitate risk

<sup>1</sup> These options are evaluated in the context of a robust set of threat scenarios

management. It focuses on goals and end-states and encourages innovation. It starts by asking questions regarding *what do we need to do* rather than *what equipment are we replacing*.

As noted by Walker [3], “The concept of CBP recognizes the interdependence of systems (including materiel and people), doctrine, organization and support in delivering defense capability, and the need to be able to examine options and trade-offs among these capability elements in terms of performance, cost and risk so as to identify optimum force development investments. CBP relies on scenarios to provide the context against which to measure the level of capability.”[4]

CBP is a systematic approach to force development that aims to advise on the most appropriate force options to meet government priorities. The force options developed should meet strategic objectives, minimize cost and risk and comply with other constraints.

CBP has several major building blocks. First, as CBP is output oriented, it must have high-level capability objectives derived from government guidance. Second, CBP needs to consider the way in which the force will fight. This generally takes the form of top-level doctrine or some overarching operational concept. Third, CBP uses standard groupings - capability clusters or capability partitions to make the process more manageable. Fourth, the resulting capabilities are realized within available resources.

An “Operational Concept<sup>2</sup>” includes strategic, operational and tactical level employment concepts. These concepts must be validated because testing a force using an invalid concept will result in a force not suitable for its planned utilization. Innovative concepts that employ emerging technologies in new ways need to be considered. The use of personnel experienced in concepts and operations is critical to the successful implementation of CBP. Thus, CBP is “*concept-led*”.

Defense capability should be assessed using plausible situations encapsulated in planning scenarios. These serve to provide context. Scenario types can be on a spectrum ranging from real world planning scenarios, through illustrative but real to the generic. Whichever type they are, these scenarios should reflect the type of tasks that the government may want its defense force to undertake, and should also be reasonably stressful for the force. CBP uses a wide range of scenarios to better prepare for the uncertainty in the challenge we face. The scenarios also provide a basis for developing goals against which capabilities are assessed.

Capability is generally tested against several scenarios over a number of time frames. The resultant insight into which scenarios drive which aspects of capability, and hence may need to be the focus of further analysis, is a beneficial spin-off of the process.

Capabilities, or the ability to perform a particular task, provide the common framework used for relating and comparing disparate elements of a defense organization. CBP relies on a structured view of the world to divide the organization into more manageable groupings. These groups are referred to as capability partitions.

---

<sup>2</sup> An Operational Concept describes how a force plans to operate in the future.

These capability partitions are inevitably based around the ability to perform tasks, or to deliver effects, for example, “Control and Denial of the Underwater Battle-space”.

When CBP is properly implemented one of the key benefits lies in its ability to help take the focus away from single-service stovepipes. This accrues from the need to usually use systems and concepts from multiple services to achieve each capability in the capability partition space. This joint focus encourages decision-makers to make judgements in the context of broad defense force goals rather than considering their own service when making capability decisions. CBP accomplishes this by providing a means to compare different options for achieving the same capability.

Capability-Based Planning provides a method for identifying the levels of capability needed to achieve the strategy, a problem common across many defense forces. With the assistance of scenarios, CBP explicitly connects capability goals to strategic requirements. These goals in turn allow for a holistic assessment of defense capability and hence the development of robust force options within the available budget to meet the range of contingencies expected by government.

### **3.1 *Desired Outcomes***

The outcome of CBP should be an effective investment strategy that develops and sustains the capability priorities identified through the planning exercise. These capability development directions can then be used to prepare an integrated Capability Development Plan. A systemic approach will ensure both an audit trail and suggest a performance management framework.

### **3.2 *An Illustrative Process***

Due to the complex nature of the problem being addressed and the analytical rigor needed, an incremental approach which develops a number of products on the way is probably most practical. The generic steps of the CBP process are shown in Figure 1 and the products should generally be the outputs of the steps in the process.

It starts with the overarching guidance, identifies capability gaps, explores options and ends with an affordable investment plan.

Most defense equipment is multi-role and thus contributes to several capability partitions. Thus it is important to share the information elicited in one capability partition with the others and to prepare analysis using consolidated force development options when providing insights on the final force structure.

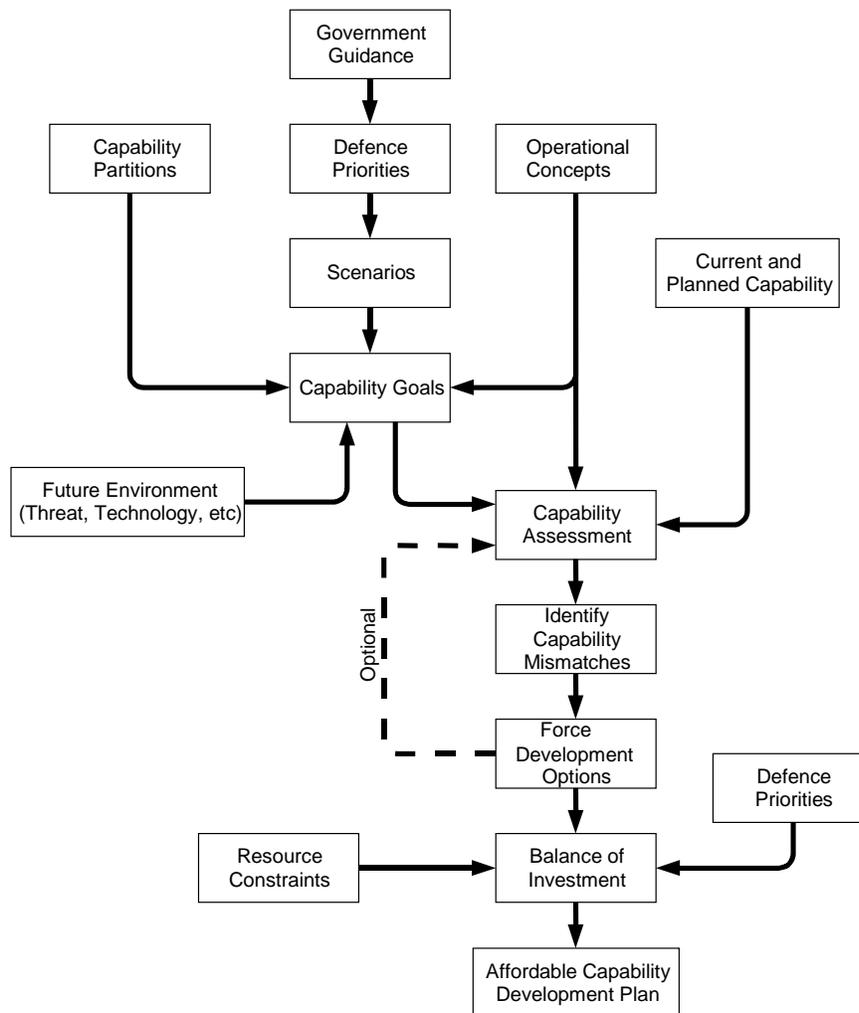


Figure 1. Generic Process Chart of Capability-Based Planning

### 3.3 Comparison with other forms of Capability Planning

CBP has two fundamental differences from other forms of traditional Capability Planning<sup>3</sup>. First, it concentrates on what you need to do rather than what you have. Second, it attempts to move away from suggesting solutions too early in the process. The aim of delaying a decision on narrowing options is to encourage the development of more innovative alternatives and to help overcome simply replacing platforms and/or equipment with like-for-like. For example, it replaces questions such as “what options are there for new artillery?” with “how can we provide fire support to land forces?”.

<sup>3</sup> For a more detailed description of alternative Capability Planning methods refer to Section 1.2. “Methods for Long Term Defence Planning” in “The use of Scenarios in Long Term Defence Planning”[3]

### **3.4 Implementation**

The first step in implementing CBP is to establish an appropriate management structure and division of responsibility. Achieving this requires commitment at senior levels and without it the benefits of CBP will be limited. This is sometimes referred to as “institutionalizing” CBP. The goals of designing the CBP process should include the following:

- Determine who will do what work (effectiveness analysis, cost-benefit analysis, and tradeoff studies within and among capabilities);
- Determine who has responsibility for the outcomes (approval and coordination);
- Determine the resources required (for analysis, as well as R&D);
- Determine how long a planning cycle will take;
- Determine what the outcome or outcomes of the process will be;
- Determine the products to be produced; and
- Ensure the process meets constraints such as timeliness.

There are many inherent challenges involved in implementing a CBP process. These include:

- Pluralism among defense interests and the number of stakeholders;
- The need to reflect the coalition context within which operations will be undertaken;
- The need for cost estimates on a consistent basis, including costs for force elements that may not yet exist;
- Resource provision for both the development and execution of the CBP process. CBP may require the development of new tools such as force structure analysis tools and costing models, if not already in the national inventory.
- It can be difficult to work at the high level of abstraction required by CBP;
- Program alignment is problematic given differing timescales for generation of Capability components, e.g. people and equipment;
- The planning environment itself is subject to change with respect to:
  - Technology,
  - Defense policy,
  - Threat,
  - Resources, and
  - Management organization;
- Options and processes are constrained by government and public service requirements;
- Options may be constrained by ethics and values, and as a result the will to explore all the options in the option space may be lacking;
- Setting capability goals and assessing against them is difficult;
- CBP considers endorsed operational concepts to be input. Reflecting the potential benefits of emerging or novel concepts may be difficult.

### **3.5 Customers of Capability-Based Planning**

There are two main groups of customers to be considered when developing the products and processes of CBP: decision-makers and capability developers. These two groups of customers generally need different products owing to their differing requirements.

Decision-makers are typically senior defense leadership and government officials. This is the group responsible for making decisions about trade-offs in defense capability development. Decision-makers will generally be interested in information such as how they can achieve their strategic objectives, what risk is there for defense due to various decisions or constraints and the impact of choosing a portfolio of options on capability.

Capability developers include the groups of planners who are required to implement the chosen initiatives and projects. Capability developers want to provide the best options to achieve capability goals and need to understand the synergies between their options and the rest of defense capability. Identifying these synergies is a complex and subjective task, but it will make success in CBP more likely.

### **3.6 Summary**

CBP has many strengths:

- CBP caters to a more diffuse and dynamic strategic environment;
- CBP links procurement decisions to strategic goals and provides an audit trail;
- CBP encourages innovation through moving away from determining equipment solutions prematurely; and
- CBP enhances the quality of information available to defense decision-makers and defense capability developers.

However, the process requires senior management commitment and the creation of an appropriate organizational context and the allocation of appropriate resources.

## **4 Guidelines for Capability-Based Planning**

The remainder of this document provides more detailed guidelines for aspects of Capability-Based Planning.

### **4.1 Stakeholder Identification and Involvement**

One of the first requirements for the successful implementation of CBP is stakeholder involvement. This must be achieved early in the process as the stakeholders generally control the information, resources and authority required to support CBP. The areas affected in Capability Planning are far reaching, ranging from strategic policy through to operations. It is important to identify these areas as early as possible to ensure that the stakeholders are involved and their requirements are considered from the outset. Stakeholders will generally include the groups responsible for the information in the section detailed below, *Inputs to Capability-Based Planning*.

Stakeholders must be included in CBP to ensure that their requirements and concerns are considered. Key stakeholders will eventually control the CBP process, and it is therefore important that they feel they have ownership of it. It is also important to ensure that stakeholders have an understanding of each other's perspective and an appreciation of the different, if not competing, requirements. The overall defense priorities promulgated by government and senior defense leadership should help to provide unifying vision.

Defense decision-makers may need to be convinced that CBP is useful for their work. Facilitated workshops involving key stakeholders in developing the process and

understanding the product are useful in addressing this issue. The use of workshops provides a forum for the stakeholders to discuss their concerns and come to a common understanding of the process and other stakeholder requirements.

## **4.2 Inputs to Capability-Based Planning**

Capability-Based Planning requires a large amount of information to be successful. Desirable inputs include, but are not limited to:

### Objectives

- Strategic guidance that allows clear priorities and objectives to be associated with different scenarios;
- Understanding of the future strategic environment.

### Context

- Information on future allied and adversary capabilities;
- Endorsed scenarios;
- Agreed operational concepts.

### Constraints

- Programming requirements – capability balance, industry imperatives, scheduling, cash flow, projects, platforms, etc.

### Framework

- Accurate information on all inputs to capability e.g. (FIC<sup>4</sup>, PRICIE<sup>5</sup>, and DOTMLP<sup>6</sup>);
- Capability partition scheme.

### Force Characteristics

- Characteristics of current and planned force elements;
- Lessons identified from operations and experimentation.

The format for these data should be easy to understand and easy to synthesize. This requires the development of detailed process descriptions, product templates and a common definition of terms.

## **4.3 Partition Design**

Capability partitions decompose the complex problem into more manageable pieces. This is necessary due to the scope of the problem; it is easier to work with the level of detail required for CBP by dividing capability into smaller groupings. The careful choice of capability partitions can also reduce the number of instances where defense equipment contributes to a number of partitions.

There are many ways to define the boundaries between capability partitions. Due to the complex nature of capability, none of them are ideal, but some are worse than others. Different parts of the organization will have different partitioning drivers; as a result one partition design may not suit the whole organization. For example,

---

<sup>4</sup> FIC are the Fundamental Inputs to Capability. FIC are an Australian construct with 8 groups being; Organization, Personnel, Collective Training, Major Systems, Supplies, Facilities, Support, Command and Management

<sup>5</sup> PRICIE is the Canadian construct of Capability Inputs. PRICIE is the acronym for Personnel, R&D/Ops Research, Infrastructure & Organization, Concepts, Doctrine & Collective Training, IT Infrastructure, Equipment, Supplies and Services.

<sup>6</sup> DOTMLP is the USA construct of Capability Inputs. DOTMLP is the abbreviation for Doctrine, Organization, Training and Education, Materiel, Leadership, People.

capability partitions will generally be different from the groupings used for budgeting. One of the advantages cited is that CBP operates in the future timeframe. This helps to bridge organizational “stovepipes”. Conversely, the budget process allocates money in accordance with current business line structures. When implementing the partition design it may be necessary to consider the trade off between applying one partition design across the entire organization and implementing different partition designs dependent on the needs of individual areas. For similar reasons, each nation may choose different ways to define its capability partitions, as each nation will have different requirements.

A key enabler for successful CBP is getting the partitions agreed by the key stakeholders. The capability development and strategic policy areas are of particular importance in this regard. As discussed later, these areas are generally responsible for setting capability goals, conducting capability assessment and developing options to reduce deficiencies. A common capability partition scheme in these areas will allow high level strategic goals to be more easily converted into capability goals and facilitate more meaningful dialogue between the two areas.

Vencel, Cook and Matthews [5] have developed a set of five heuristics for assessing Partition design, as shown in Figure 2.

| <b>Heuristic</b>                 | <b>Explanation/Application</b>  |
|----------------------------------|---|
| <b>Similarity</b>                | A domain (or domain set) should contain elements that have similar characteristics.   |
| <b>Partitioning</b>              | Domains (or domain sets) should be partitioned so as to minimize the interfaces between the components of different domains (or domain sets). |
| <b>Aggregation</b>               | A domain should be structured hierarchically in an appropriate manner. There should be in the order of $7 \pm 2$ elements at each level.      |
| <b>Stable Intermediate Forms</b> | The domain (or domain set) should be assembled from stable intermediate components.   |
| <b>Form, Fit &amp; Function</b>  | The structure of the domain (or domain set) should resemble a related functional structure in the organization.                               |

**Figure 2. Heuristics for assessing capability partition design**

Potential problems with the use of capability partitioning need be overcome to permit the successful implementation of CBP. Most significantly, it is difficult to account for synergies and dependencies across partitions. Additionally, once information has been elicited within the partition it must facilitate aggregation to allow for whole of force considerations, or easy translation if the capability is used in a different partition. It will do little good if we replace old “stovepipes” with new, capability-based stovepipes!

#### **4.4 Use of Scenarios**

Scenarios are a critical part of CBP as advocated in this paper. They provide the essential link between defense policy and capability objectives. The scenarios

employed should be common across the defense force, and should accommodate the range of all operation types that a government expects its forces to engage in.

The intent is not so much to use these scenarios as alternative futures or as exploration venues but rather to provide context. This use of scenarios assists in the development of realistic capability goals and the provision of a defense force that meets government requirements at a minimum cost. Scenarios should also ideally cater for a series of time frames to facilitate an assessment of capability through time, rather than at a single arbitrary point in the future.

It is important that a broad range of scenarios is used in CBP. The use of a limited number of scenarios or scenarios that are too similar will result in a defense force that is unable to cope with a wide range of circumstances. On the other hand, the use of too many scenarios will significantly increase the workload required for CBP.

To understand fully capability requirements and derive meaningful gap assessments, it is important to test a given force structure using scenarios that appropriately challenge the force. Scenarios that do not thoroughly test a force structure will not identify where weaknesses and problems exist and hence may contribute to proposing a force structure that is inherently unsuitable for a wide range of situations. Concurrency may also be a force determinant, and defense policy with regard to concurrent operations must be captured. This will determine which combinations of scenario types a force structure under assessment will need to be able to support.

Scenarios need to be developed at the operational level to aid in the refinement of capability goals. Developing capability goals based around the specific implementation of scenarios allows the incorporation of more detail and greater fidelity, thereby facilitating the use of constructive simulations and war games. This needs to be approached with caution. The capability planners risk altering the focus from what needs to be done to how to do it, which may constrain the range of possible solutions.

#### **4.5 Capability Goals**

Goal setting provides the means for setting the desired level of capability needed to achieve the stated objectives. Goal setting is the hardest part of the process and requires a combination of imagination and subject matter expertise. These goals need to be developed across the same set of time periods for which planning scenarios have been identified, with the more distant time frames typically being more difficult.

As depicted in Figure 1, capability goals should be developed based on, amongst other considerations:

- Defense priorities;
- Partitions chosen;
- Threat appreciation;
- Scenarios used;
- The possible impacts of future friendly and threat technology, particularly disruptive change;
- Affordability;

- Risk (military, national power, concepts failure etc); and
- The concepts employed.

Capability goals should be determined based on ensuring success (appropriately defined) in the most stressing task facing a particular capability in a specific scenario. This helps establish the maximum capability level required and reduces the number of goals that have to be developed, and thus measured, for each capability. These goals will vary between campaigns and over time.

The classes of goals developed will vary; the UK in their CBP process identifies three classes of goals. The goals are:

- Explicit* - The goal can be quantified from campaign analysis. For instance, in a scenario involving flood relief the airlift capability will have an explicit goal.
- Implicit* - The goal can be defined in terms of capabilities required to ensure the course of events seen in a model, war game or campaign could be followed, even though they may not actually be employed. For example, a warship conducting a blockade can stop a merchant ship to search it because it has the ability to damage or sink it. In any simulation of such an operation one would not expect to see merchant ships sunk, but success of the operation depends on the implicit capability to do so if required.
- Enabling*- The capability enables an implicit or explicit capability and can only be quantified when the solutions to those capabilities are understood. For a warfighting scenario, airlift capability would be an enabler allowing for the movement of combat and other assets to where they are required.

The goals developed will vary depending on the type of scenario tested; a capability with an explicit goal in one scenario may be an enabling capability in another.

A critical stage in establishing the goals is determining the level of aggregation to be used in the analysis. Higher levels of aggregation mean fewer (albeit more complex) goals and thus fewer assessments. These assessments will require analytical tools and subject matter expertise appropriate to more aggregated capabilities. Lower levels of aggregation result in more but simpler assessments, as the goals may be similar to requirement statements for individual systems performing single tasks. The risk with working at a lower level is that the presence of certain force elements or the need to perform certain tactical tasks may become an input assumption.

The following example illustrates the above issue:

Suppose that a capability partition scheme has a 'sea control' capability. A suitable definition for this capability might be to achieve a certain level of survivability for friendly maritime platforms within a scenario. This could be assessed, but would require some form of maritime campaign model able to capture the contributions and interactions of the range of force elements that would contribute toward survivability.

An alternative approach would be to break down 'sea control' into a set of less aggregated capabilities such as 'track submarine'. However, doing so would presume an operational concept that requires submarines to be tracked and the

presence of suitable assets (such as maritime patrol aircraft) in the deployed force. Although the lower level approach might be prejudging the operational concept it is likely to lead to simpler goals and easier assessments.

In the first case the goal, and associated metric, is likely to be complex. For example: *Force elements in area A to have probability of survival of B over duration C whilst subject to attack from surface, subsurface and air threats E, F and G.* This would require detailed analysis to evaluate.

In the second case goals would be simpler, for example: *Surveillance systems to have a probability of W of maintaining track on a submarine class X operating in area Y at a distance Z from friendly high-value assets.* The assessment of this goal will be easier to make and may be amenable to expert judgement.

#### 4.6 Capability Assessment

Capability assessment involves summing the various elements of the capability against the capability goals developed at various times in the future. The assessment should be derived from the most suitable method available, which could include analysis, outcomes from real operations and expert judgement.

It is important to assess capability from the near-term to the distant future. This is to allow for changes in defense capability to be tracked over time and to determine when changes occur. Some nations practicing CBP typically assess capability three or four times over approximately 15 years to strike the balance between excessive work and large gaps in the assessment.

An example capability assessment matrix is shown in Figure 3. The format presented below is one of a range of formats available for the presentation of results. Guidelines regarding the presentation of results will be discussed in more detail later.

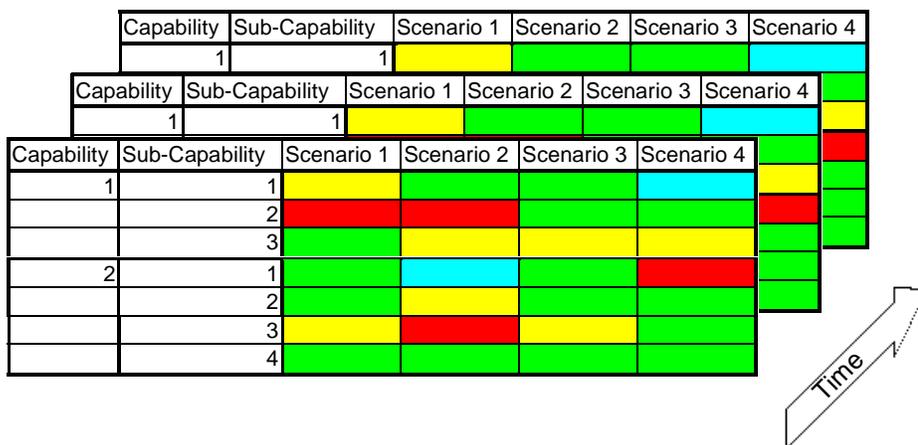


Figure 3. Example Capability Assessment Matrix<sup>7</sup>

<sup>7</sup> The meaning of the colours can vary for example Red- major deficiencies, Yellow- minor deficiencies, Green- sufficient capability and Blue- capability affluence.

Capability assessment needs to consider all of the inputs to capability and must allow for a whole of force picture to be developed. This requires an extension of the analysis from single scenario assessments of force structure to assessments that span multiple concurrent operations, where required by policy. This will lead to informed decisions as to the required balance among force elements in both the quality and the quantity dimension.

The identification of capability mismatches<sup>8</sup> must be comprehensive, although the way each assessment is made should not be prescriptive. The use of objective analysis is preferred. In cases where objective analysis is of low quality or missing altogether, expert subjective judgement must be employed.

It is important to preserve an audit trail as to how assessments were made, including an assessment of their objectivity. This will help senior decision-makers understand the provenance and robustness of the evidence. The audit trail for the assessments comprises one part of the overall CBP audit trail, which is discussed further in section 4.10.

#### **4.7 Development and Costing of Force Development Options**

The development of realistic force development options is a key step in linking capability mismatches to the development of an affordable capability development plan. The development of force development options is a complicated task, which requires the input of subject matter experts and skilled staff.

Force development options are developed to mitigate the capability mismatches identified in the assessment stage. Options should be defined in sufficient detail that they could be assessed against the relevant goals<sup>9</sup>.

One of the most difficult areas in developing force development options is in obtaining realistic costs, especially for options in the longer time horizon or when considering new capabilities. These costs should be whole-of-life to help in the comparison of options with different spend spreads. Whole-of-life costs recognize that the majority of defense costs are in through-life support rather than in acquisition.

The full costs of changes in capability are needed to make a valid comparison of force development options in balance of investment analysis. Some force development options may impact across a range of capability partitions. In particular, options involving multi-role platforms/systems will have secondary effects on other capability areas. Therefore, costings need to take account all of the defense capability implications, not just the direct cost of the particular options. An illustration might be the comparison of 'trading in' a large air defense (AD) frigate, which is also capable of both anti-submarine warfare (ASW) and anti-surface warfare (ASuW), for a smaller vessel capable only of AD. The cost benefits accruing from purchase of a fleet of smaller vessels must be offset by the cost of regaining the lost ASW and ASuW capability by some alternative means (assuming those capabilities are still needed).

---

<sup>8</sup> Mismatches could refer to gaps or excesses. Identifying areas where excess capacity is present is important in an era of constrained resources.

<sup>9</sup> This must involve studying the implications across all inputs to capability (e.g. FIC/PRICIE/DOTMLP) to ensure secondary and tertiary effects are accounted for.

Such an offset may negate any apparent cost benefits of the smaller vessel when considered in isolation; indeed, it could be that the cost of regaining the lost capabilities exceeds the cost of the original platform being traded-off<sup>10</sup>.

#### **4.8 Balance of Investment**

Balance of Investment (BOI) involves evaluating the requirements of the defense force in terms of cost, capability and schedule within applicable constraints. It requires the synthesis of the key findings developed across all capability partitions. Out of the BOI exercise, a framework for investment should be developed. This serves as the basis upon which defense develops its strategic investment or capability development plan.

The BOI process is generally conducted only once for each iteration of the CBP process, due to resource demand, and covers all applicable time frames. It integrates the key findings developed across all capability partitions including those of cost by year and capability.

BOI can either use an analytical framework or, more usually, a ‘facilitated committee process’. Within that process, decision-makers confront the issue of allocating a limited budget to the proposed force development options to achieve the capability goals. A precursor prioritization of capability goals and mismatches can help identify areas requiring special attention.

The committee process is used because tools and techniques have not and probably cannot be developed which can combine all the information required for BOI. Within single capability partitions, however, optimization tools exist and can support the process. Similarly, decision support tools can be of great benefit in structuring the problem, helping facilitate discussion and developing potentially feasible solutions. The committee process also acknowledges that decision-makers bring their own experience and knowledge to the process and ultimately they are responsible for making decisions.

#### **4.9 Presentation of Results**

The output of the Capability-Based Planning process needs to be carefully developed to ensure that the information presented is useful in making decisions. The information should preferably be presented in a simple and easily understood way that avoids aggregation of assessments so that the decision-maker can drill down to detailed descriptions. A presentation that summarizes an area of defense capability as

---

<sup>10</sup> In principle the cost of a given capability can be deduced from the cost of its constituent force elements. A number of practical problems arise, however, and become acute when evaluating cost across the entire defence programme:

- Many force elements—especially large platforms—contribute to more than one capability.
- Most or all capabilities are provided by more than one force element.
- The many-to-many mapping between force elements and capabilities will be complex and highly subjective.
- If one force element-capability need is changed, there will be significant effects on the costs of other capabilities.

Thus, attributing cost to capability (and hence determining the proportional cost to the budget of owning the whole of a capability) across the whole of defence would be a daunting and possibly unachievable task. But, since capability *per se* is not managed as a budgetary item, there is unlikely to be a real requirement to cost the whole of a capability.

red or deficient may hide one small deficiency or several major deficiencies. Any system developed for the presentation of results should be able to distinguish between the two situations. The ultimate aim of the presentation is to demonstrate the extent to which force development options meet (or exceed) the stated defense policy.

#### **4.10 Audit Trail**

The development of an audit trail is essential to demonstrate the validity of the results and gain the confidence of decision-makers. The outputs from the CBP process will take many forms but will ultimately derive a capability development plan that includes traceability of decisions. The other outputs might include lists of scheduled projects supplemented by traffic light<sup>11</sup> summaries or more traditional formats such as impact statements or the pros and cons of alternative proposals. These types of reports require a substantial audit trail to provide the underpinning credibility of decisions and for government audit requirements. In designing the 'audit trail', however, it is important to decide ahead of time what types of questions would be asked in an audit. An audit trail may entail special data collection requirements.

#### **4.11 Future Issues for Capability-Based Planning**

Several issues need to be investigated for the continued development of CBP. These issues generally involve changes to the way defense operates and/or tools available to defense capability developers. The impact of a network-centric force has potential consequences for the viability of capability partitions as defense equipment is used in novel ways that involve greater interaction between the equipments, thus making it more difficult to assess individual contributions. The use of operational and capability architectures has the ability to assist in CBP, particularly in linking CBP with strategic guidance and the warfighting concept. It may also assist in providing the more holistic view needed to assess network-centric forces.

Tools for knowledge management should prove useful in capturing, combining and displaying information. Measures of utility are required in order to place the BOI stages onto a more objective footing as without them it is difficult to articulate the merits of alternative approaches, especially when plans to address all capability requirements are likely to be unaffordable.

Any CBP process must also continue to evolve and demonstrate its relevance. Only in that way will senior leadership remain committed to the process and ensure that it is at the center of defense management and not relegated to being 'yesterday's initiative'.

## **5 Conclusion**

Capability-Based Planning can be used to derive a capability development plan for a robust defense force that meets strategic objectives. CBP involves the partitioning and assessment of defense capabilities. It provides a detailed picture of defense capability and helps defense to allocate its scarce resources among vastly different capabilities. It also provides a more flexible and cost effective basis for defense planning than like-for-like replacement of systems along single-service lines.

---

<sup>11</sup> Traffic light presentations use the colours of traffic lights (ie green, amber and red) to show the performance (eg good, average, poor) of a range of options.

## 6 References

1. NATO Research and Technology Board: Panel On Studies, Analysis and Simulation (SAS), *Handbook in Long Term Defense Planning*, 2001.
2. Davis, P.K., *Analytic Architecture for Capabilities-Based Planning, Mission-System Analysis, and Transformation*, RAND MR-1513-OSD, 2002.
3. NATO, *The Use Of Scenarios In Long Term Defense Planning*  
<http://www.plausiblefutures.com/55074>
4. NATO Research and Technology Board: Panel On Studies, Analysis and Simulation (SAS), *Handbook in Long Term Defense Planning*, 2001.
5. Walker, RS, *Towards Defense Capability Management: A Discussion Paper*, 2002.
6. Vencel, L., Cook, S. & Matthews, D., *A Systems Analysis of the DCPG Capability Domain Architecture - Part One: Characteristics of an Idealized Domain and Domain Set*. DSTO Technical Report, Edinburgh, Australia, 2002.