How Much is Enough?

Generating Capability Requirements

Dawn Thomas
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Where am I from?

About CNA

• Not-for-profit
• Serving all of government
• More than $115 million in revenue
• More than 700 people

History of service

• 1942: Created during World War II, pioneered the field of operations research for the U.S. Navy
• 1962: Operations Evaluations Group and the Naval Studies Institute join to become CNA
• Since 1990: Operates the Center for Naval Analyses and the Institute for Public Research
  – Institute includes the Safety and Security Division
Background: It started with assessments

- Capability assessments have been quite the rage
  - Office for Domestic Preparedness 2003 survey
  - DHS Pilot Capability Assessment in 2007
  - Past and present versions of the State Preparedness Report
  - Internal assessments
    - After disasters and for disaster planning
    - To generate data for state strategies, investment justifications, etc.

- After doing many, we have learned a thing or two
  - Measure what matters
    - Set preparedness against a background of risk – what is probable versus what is possible
    - Ensure relevance to operational personnel and political leadership
  - Measure to predict performance, not only to have an inventory
Background: So you’ve done your assessment…
Background – Then came PPD-8

• March, 2011, the President releases Presidential Policy Directive-8
• National Preparedness Goal presents core capabilities
• In response FEMA release a National Preparedness System
  – “Identifying and Assessing Risk” is carried out in the THIRA process
  – State Preparedness Reports touch on this, but still not a complete solution for, “Estimating Capability Requirements”
Why do we develop capability requirements?

- Knowing capability requirements is critical to understanding gaps
- Without them it can be difficult to determine when to switch from building capability to maintenance
- Once you determine an appropriate level of capability preparedness, you can then estimate associated costs
- We have used variations of two basic approaches:
  - Mining information from subject matter experts (not today’s focus)
  - Resource requirement models and calculators (today’s focus!)
One approach: Mining subject matter experts

**Pros**
- Continues the integrated planning approach
- Focuses on what is most relevant to the jurisdiction/region conducting the assessment

**Cons**
- Labor intensive for jurisdictional experts
- Extreme subjective; qualitative

**Utility**
- Determine courses of action for strategic and investment planning
- Establish strategic priorities and track progress against them
Another approach: Modeling resource requirements

- **Pros**
  - Quantitative estimation of capability
  - Breaks down a complicated problem into specific variables

- **Utility**
  - Detailed understanding of resources needed and costs to achieve a capability
    - How prepared can we afford to be?
    - Inform and justify future resource investments
  - Exercise planning
  - Developing concepts of operations (CONOPS)

- **Cons**
  - Requires detailed, accurate, up-to-date data
  - Scenario specific; narrowly focused
  - Only applicable for resource-intensive capabilities
A bright idea, some time, and some resources…

- Requirement models were:
  - Designed for specific geographic areas
  - Designed against specific scenarios (based on local threat)
  - Calculated life-cycle costs based on requirements generated

- We turned them into requirement calculators, which are:
  - Free!
  - Based on population, but include jurisdictional factors such as threats and hazards
  - Are either not based on scenario, or allow the user to define the parts of the scenario that changes requirements
  - Still calculate life-cycle costs
• **Explosive Devise Response Operations** – estimates the number of each bomb squad type a jurisdiction needs, and the associated resources and costs.

• **Technical Search and Rescue (SAR)** – estimates the # of each SAR team type a jurisdiction needs, and the associated resources and costs.

• **Non-Medical Points of Distribution (PODs)** – estimates the # of PODs needed in a jurisdiction, and the associated resources and costs.

• **Weapons of Mass Destruction (WMD)/Hazardous Materials (HAZMAT)** – estimates the # of each WMD/HAZMAT team type a jurisdiction needs, and the associated resources and costs.

• **Emergency Public Safety and Security Response** – estimates the # of personnel, equipment, and training needed to set up security for events of a specific size, and the associated resources and costs.
Method and approach: Requirements and cost

• First, we used Federal guidance and relevant stakeholders to set standards
  – DHS/FEMA Target Capabilities
  – DHS/FEMA National Incident Management System (NIMS) Resource Typing
  – Other federal planning documents (USACE; HHS)
  – Regulatory documents (such as those from National Bomb Squad Commanders Advisory Board)

• Then, we determined what it costs to build capability up to those standards
  – Equipment lists from Federal guidance and best practices
  – Prices from General Services Administration (GSA) Advantage (government pricing)
Method and approach: Life-cycle costs

• We then used requirements and costs to calculate initial and annual costs

• Initial costs are based on equipment prices and quantities

• Annual costs include equipment maintenance and replacement costs, personnel salaries, and training costs
  – Equipment maintenance costs fall in four categories: operating, energy, repair, and upgrade
  – Equipment replacement costs are amortized over the expected shelf life of the item
  – Training costs include both tuition and backfill costs, and are based on the expected personnel turnover rate
Method and approach: Technical information

- Developed in Microsoft Excel 2007
  - Each sheet in the workbook represents a page
  - Users move through the pages using links and a graphics-based navigation bar
  - Macros written in Visual Basic for Applications are used to perform background tasks
  - Sheets are protected to prevent users from making unintended changes
What you need to get started

- **Capability calculator/tool**
  - To be described in more detail

- **White paper**
  - Includes an overview of life-cycle cost analysis, references, and information unique to each calculator

- **Technical guide**
  - A step-by-step walkthrough to assist users while working with the calculator
Example Capability Calculator

Emergency Public Safety and Security Response
Resource descriptions and general guidance

- Calculator provides the information needed to use it, such as team type descriptions, etc.

- Two teams comprise this capability
  - Crowd control teams
  - Perimeter and checkpoint teams

- For each team, calculator generates necessary equipment, vehicles, personnel and training

- There is more planning information and descriptions in the white paper and technical guide that accompanies each calculator
Welcome and navigation

- Calculators are designed to be easy to navigate

- It helps to see the overall structure of the calculator to better understand where each step fits in
User Input: Customizing your calculator

- Event information

<table>
<thead>
<tr>
<th>Expected number of attendees</th>
<th>25,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of event</td>
<td>6 hours</td>
</tr>
<tr>
<td>Number of officer shifts</td>
<td>1 shift(s)</td>
</tr>
<tr>
<td>How often does this kind of event occur?</td>
<td>1 time(s) per year</td>
</tr>
</tbody>
</table>

- Crowd control factors
  - E.g. Desired officer-to-crowd ratio? (includes tips on how to calculate this)

- Perimeter/checkpoint factors
  - E.g. Does the event require a single or a double perimeter? (includes a discussion on the difference)

While PINK cells contain default data, they can be customized as desired
Output: Overview of your team requirement

• Using the standards stated up front, the calculator estimates the number of teams you need

• All calculators define the team as the equipment, personnel, and training that comprise it
  • Some calculators provide more – in this case, the crowd control calculator also provides vehicle requirements

• You can stop at this point and look at the associated costs, or you can do more customization
  • Initial users argued that jurisdictional teams vary widely, such as in the number and type of personnel they use, and/or training they require
Details: Equipment, vehicles, personnel and training

### Crowd Control Equipment

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Default Quantity per Team</th>
<th>Quantity per Team</th>
<th>Total Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Grenade&quot; Launcher</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Smoke grenades</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>&quot;Grenades&quot;</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Fogger</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Oleoresin Capsicum Fog Cartridge</td>
<td>90</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Riot control batons</td>
<td>59</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td>Bullhorns</td>
<td>59</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td>Pepper spray</td>
<td>59</td>
<td>59</td>
<td>59</td>
</tr>
</tbody>
</table>
Output: Initial team and total costs

Initial total team costs

- Equipment Initial Costs: 87.5%
- Training Initial Costs: 12.5%
- User Input Equipment Initial Costs: 0.0%

Why are there no personnel costs?

Because personnel are annual operational costs, reflected in the next slide…
Output: Annual team and total costs

Annual Cost Breakdown

- Total Annual Equipment Costs: 88.7%
- Total Personnel Annual Costs: 2.6%
- Total Training Annual Costs: 8.7%
- Total User Input Annual Costs: 0.0%

How is this different than initial cost?
Annual costs include maintaining and operating equipment, salaries, and maintenance training.
Option to calculate gap in team requirements

### Gap Calculation

<table>
<thead>
<tr>
<th>Suggested Capability Level</th>
<th>Current Capability Level</th>
<th>Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crowd Control Team(s)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Checkpoint Team(s)</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Perimeter Barriers</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>
Wrapping up…

• The process of stepping through the calculators is as important as the results
  – They condense lengthy planning guidance documents into key considerations

• Jurisdictional planners can use results to determine appropriate levels of preparedness, budgeting, and grant applications
  – Great data for Investment Justifications
  – Sparks much-needed discussion about purchasing versus mutual aid and other ways of filling requirements
Group discussion

• What are some methods your organization/jurisdiction have used to calculate requirements?
  – How have you calculated requirements in the past?

• What requirement questions are the most vexing?

• Do you see PPD-8 and the National Preparedness System changing the way you have calculated requirements in the past?
More questions (or answers)
Dawn Thomas, Associate Director
CNA Safety and Security
thomasdh@cna.org
(703) 824 - 2160