

# ***Strategic Analysis of Naval Force Structure***

**DoD Force Structure Analysis Way Ahead  
WG 5: “Analytic Tools and Data for Force Structure Analysis”**

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# ***Strategic Analysis of Naval Force Structure***

- ◆ **Why Strategic Analysis (long range business planning)?**
  - Why force structure is important to the Navy
  - Nature of the problem: the force structure challenge and strategic planning context
  - Planning Phases to Strategic Force Analysis Methodology (phases & fidelity are important)
  - Phases and Components with driving factors addressing capacity, warfare areas, & capability
- ◆ **The Phases and Sufficiency Analysis**
  - Phase definitions identifying objectives and products
  - Sufficiency analysis process, driving factors, and warfare areas
- ◆ **Tools and Models**
  - ForceSAM construct and analysis toolkit
  - Shipbuilding (FAIM); fleet capacities (XPI) module; MMR module; Shipyard Loading module
  - Other: Fleet Affordability Tool, Fleet Design & Presence Model; FFAN capability module
- ◆ **Summary and Take-Aways**

# Why Strategic Analysis?

## ♦ Why strategic analysis of Naval force structure

- Global and National Uncertainty and Change
  - US roles in World and DoD Mission – Transnational Threat & Terrorism
  - Transformation Opportunity for Change
- Support DoD Analytical Agenda and Naval strategic guidance (maritime strategy, etc.)

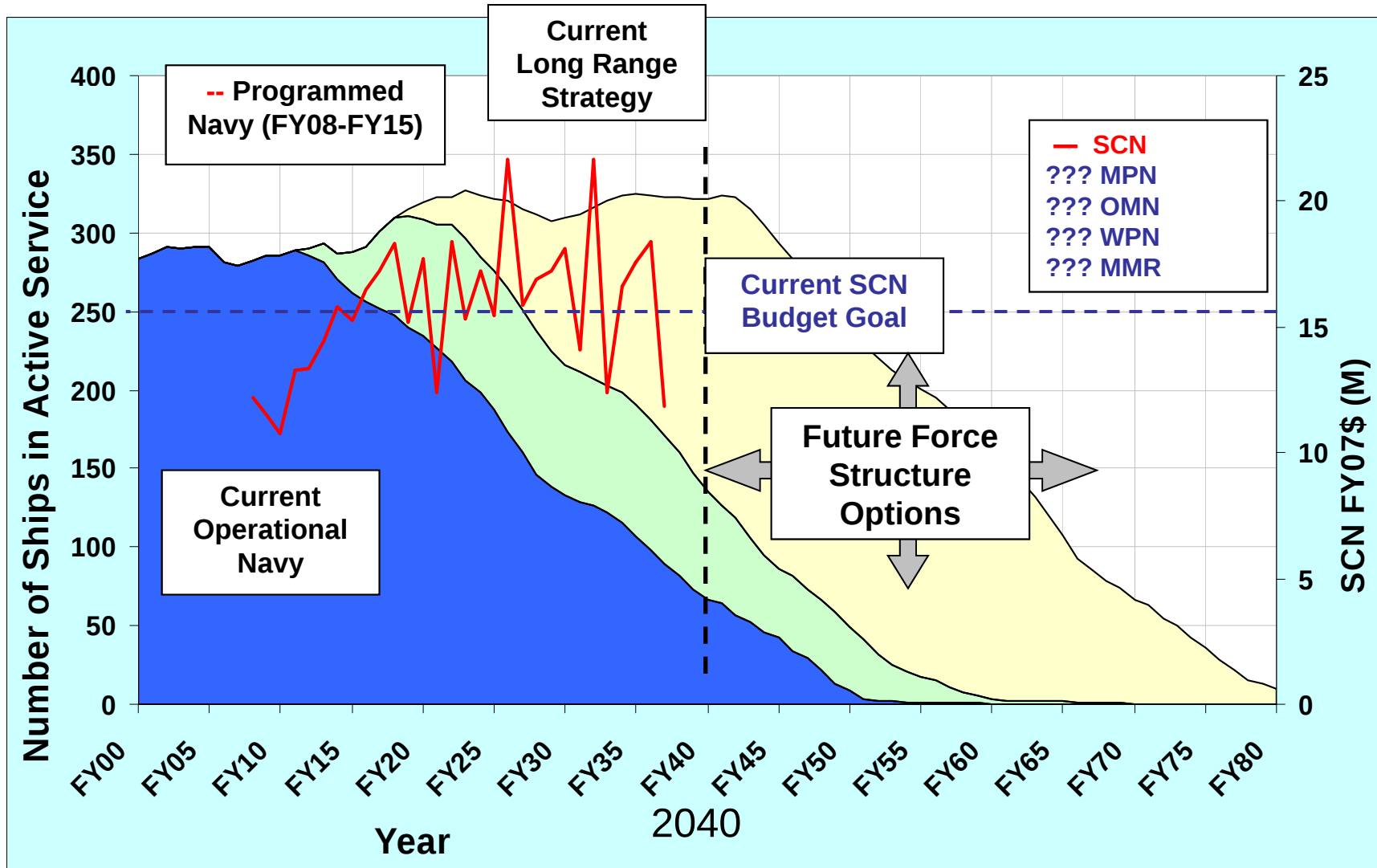
## ♦ Why important to Navy

- Ships are Unique & Need Long-Term Focus
  - 10 years for concept to production & 30-50 years for production through operation
  - Ships are complex, Integrated Warfare Systems & components of an integrated force architecture
- Support OSD/Navy customers in examining and developing robust alternative Ship Acquisition Strategies and resulting force structures and ultimately analysis trade space for senior leadership
  - Analysis Develops Multiple Fleet Options For Evaluation & Comparison
  - Balancing cost, capability, and industrial base. Assessing resulting risk and defining trade space
  - Shipbuilding plan, technology commitments, current programs v. future investment
- A Need for Analytic Rigor -- develop and operate analysis tools and integrated environment
  - Analysis toolkit of legacy Force Structure and Affordability models
  - Force Level design tools and capability assessments
  - Broad, consistent, and integrated treatment of information & tools
  - Maintain shipbuilding plans & databases for technology, combat systems, and ship concepts

*Influence Naval Force Structure (what we buy, how many, & capability delivered)*

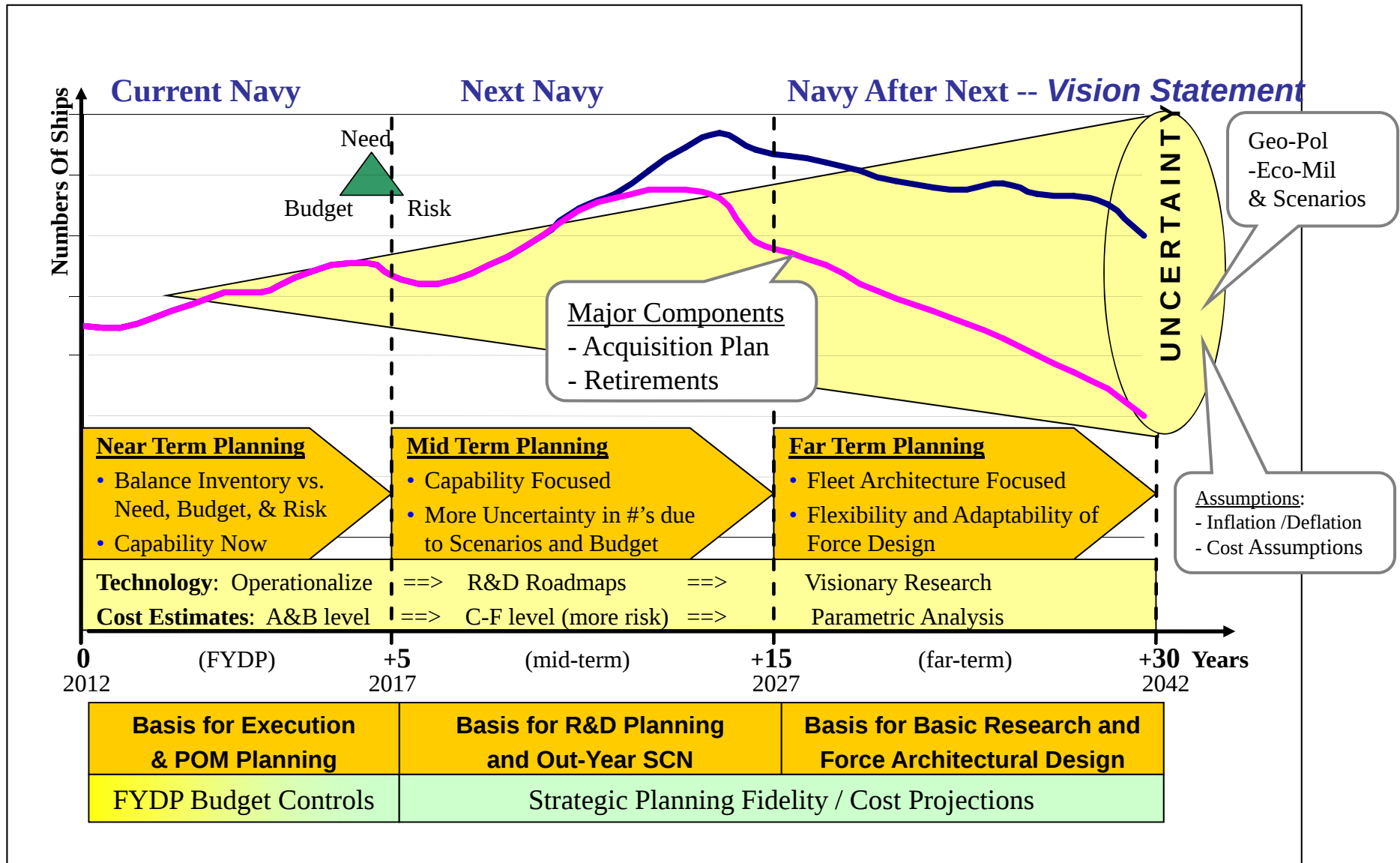
# Force Structure Challenge

## Naval Ships

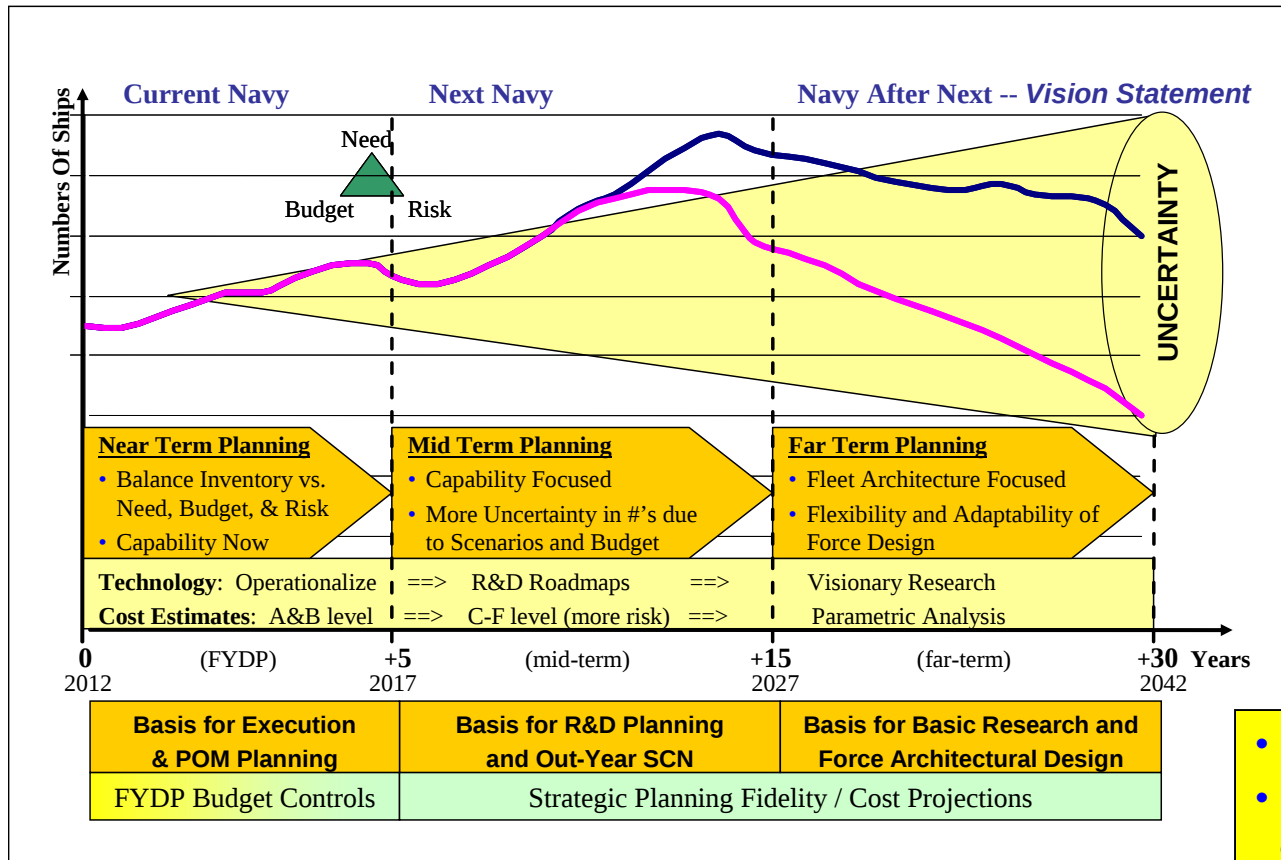


**15-20 Years for Significant Force Level Operational Impact**

# Strategic Planning Context



# Strategic Force Analysis: Four Phases



## (1) Futures & Design Guidance

Establishes design vision and future world context.

## (4) Strategy Assessment

Provides long-term force design insights to decision makers

Evolving futures and force designs

## (2) Force Design

Designs the force based on vision statement, world context, and financial constraints

Systems Engineering Approach

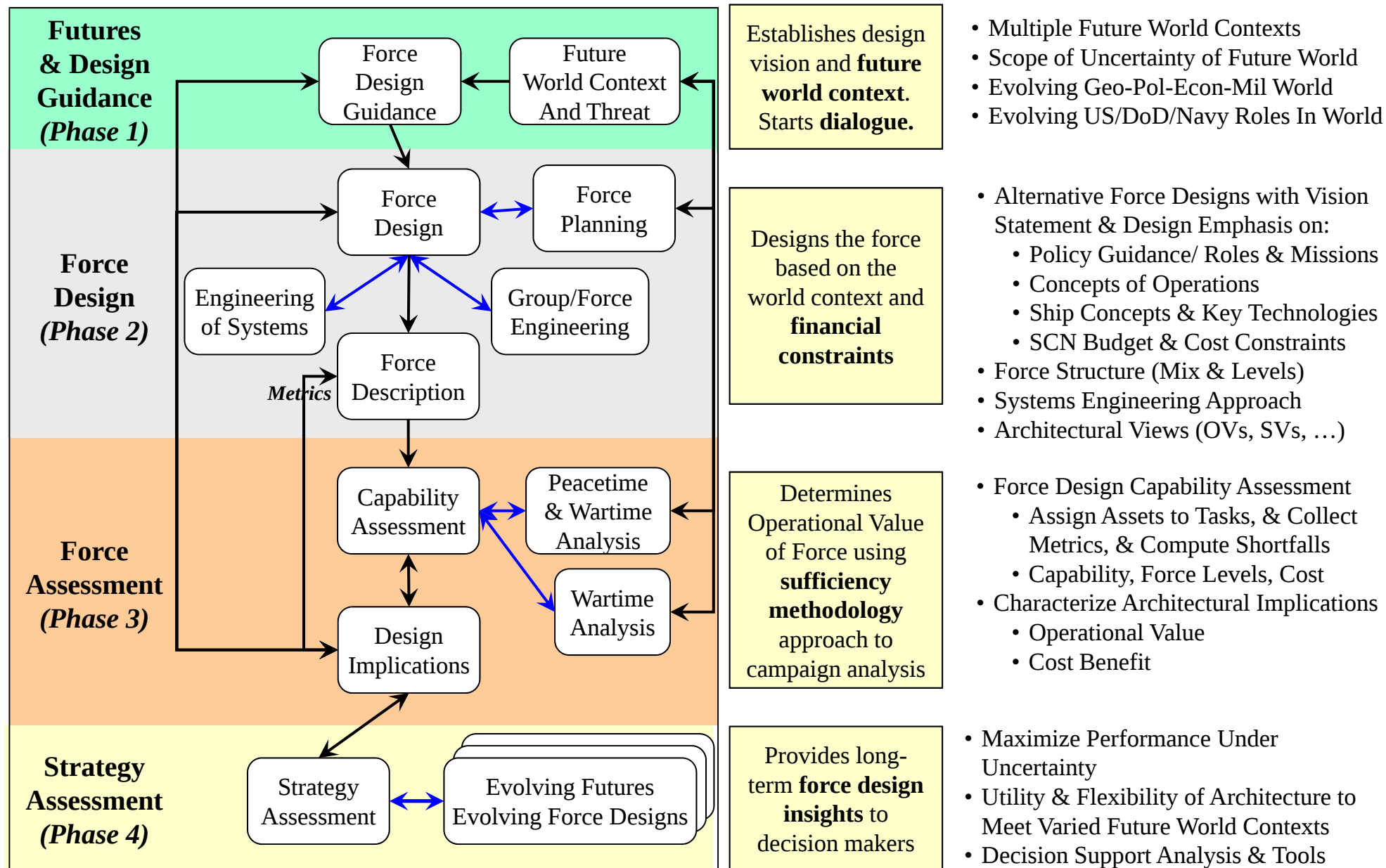
## (3) Force Assessment

Determines capacities and operational value of force

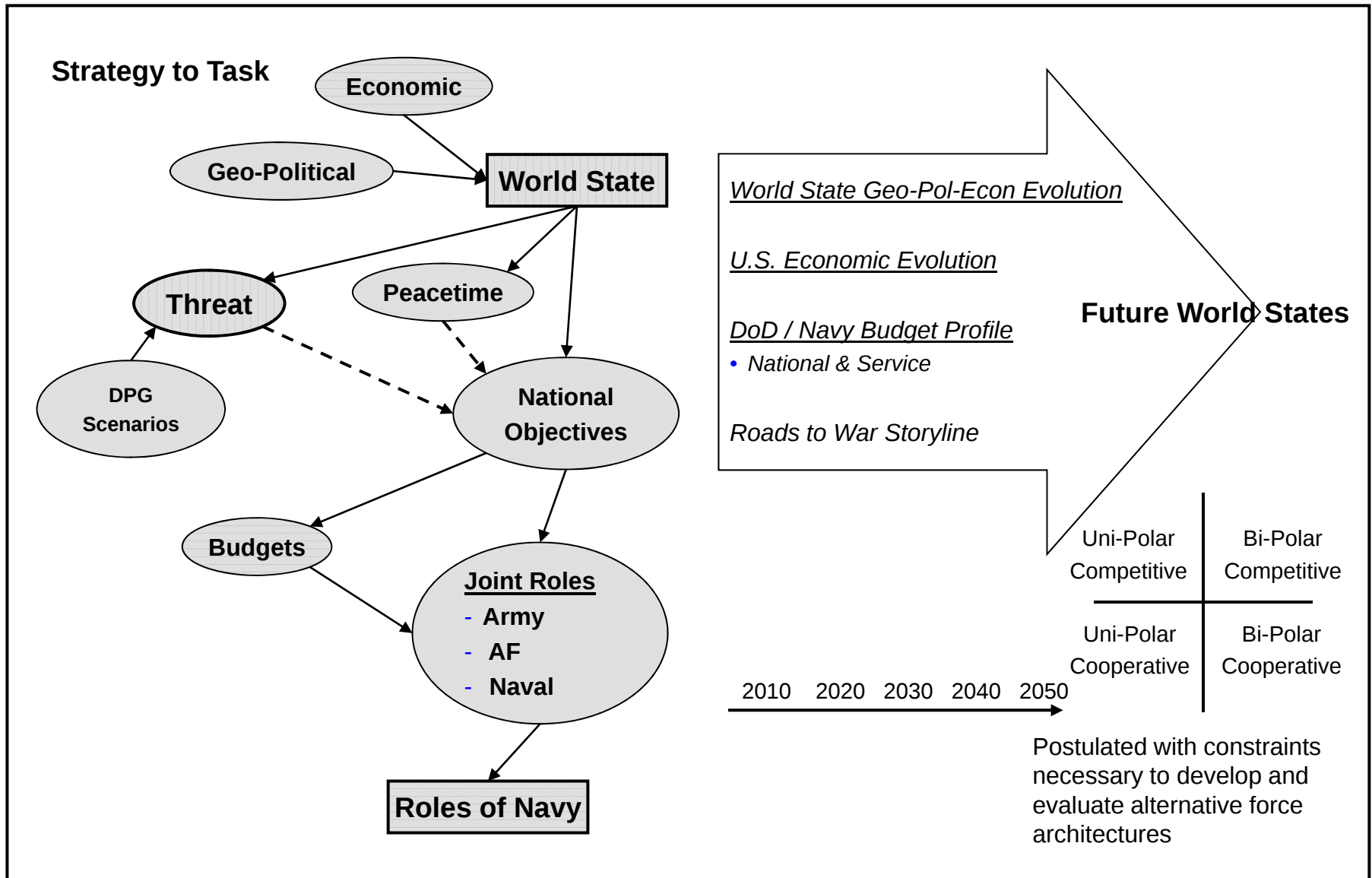
Sufficiency methodology approach to campaign & mission analysis

- Long-term force level perspective
- Each Phases identifies driving factors and metrics.
- Maintain force level scope and fidelity within each phase is essential.
- Methodology must be flexible (varied studies) and repeatable (evolving force designs, futures, and assessments).
  - iterative & recursive.

# Strategic Force Analysis Methodology



# Futures & Design Guidance (Phase 1)



## ***Force Design Tasks (Phase 2)***

### **◆ Joint Service Evolution**

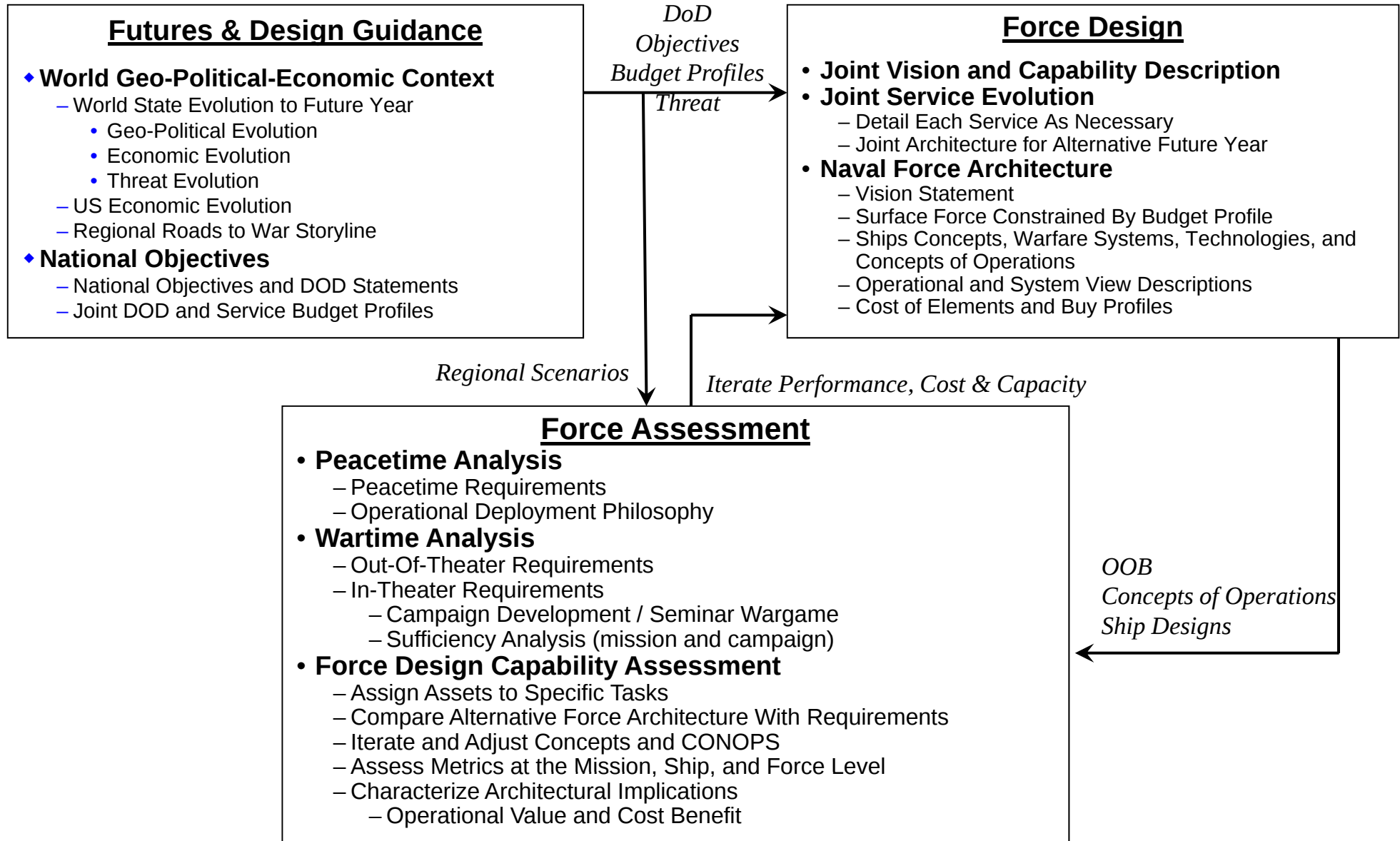
- Joint Service Vision and Capability Description
- Detail Each Service As Necessary
  - Army, Air Force, Marine, Naval, and Coast Guard
  - Service Roles, Organization, Inventory
- Joint Service Architecture for Future Year

### **◆ Naval Force Design**

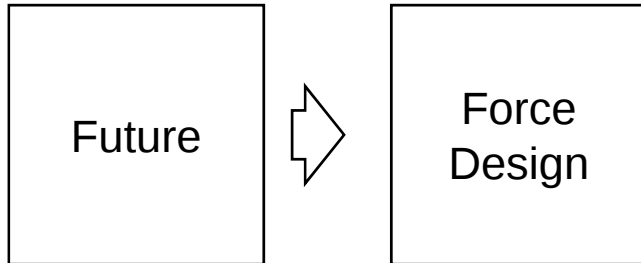
- Vision Statement
- Develop ship concepts, alternatives, and concepts of operation
- Develop technology roadmaps and combat system evolutions
- Basing, Logistics, and Support Philosophy
- Construct surface force structure constrained by alternative future
- Develop Operational View Descriptions
- Buy Profiles and Acquisition Strategies

# Force Assessment (Phase 3)

## An Iterative Approach

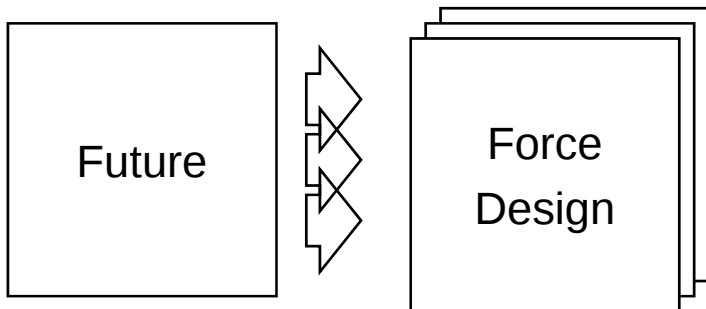


# Strategy Assessment (Phase 4)



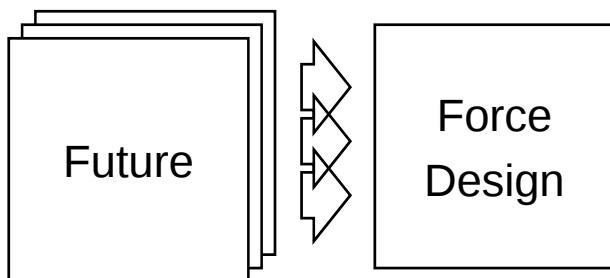
## Force Assessment

Operational value & cost benefit analysis  
capability, force level, cost



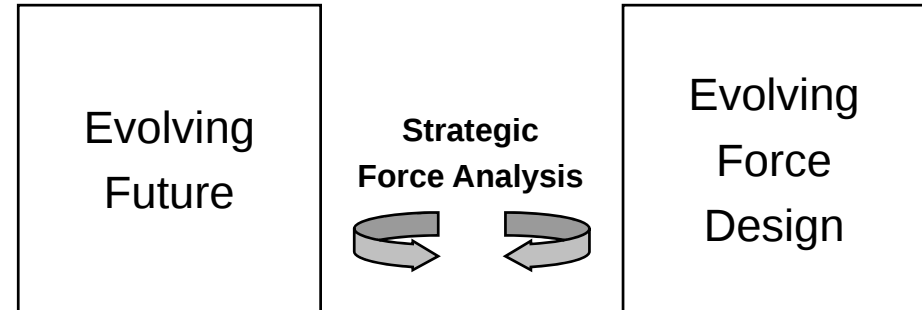
## Alternative Force Designs

Technology, Ship Concepts, Combat Systems, Cost



## Multiple Futures

Scope of un-certainty



## Strategy Assessment

- Maximize Performance Under Uncertainty
- Utility and Flexibility of An Architecture To Meet Requirements of Varied Future World Contexts
- Technology Investment Strategies

## Naval Force Structure

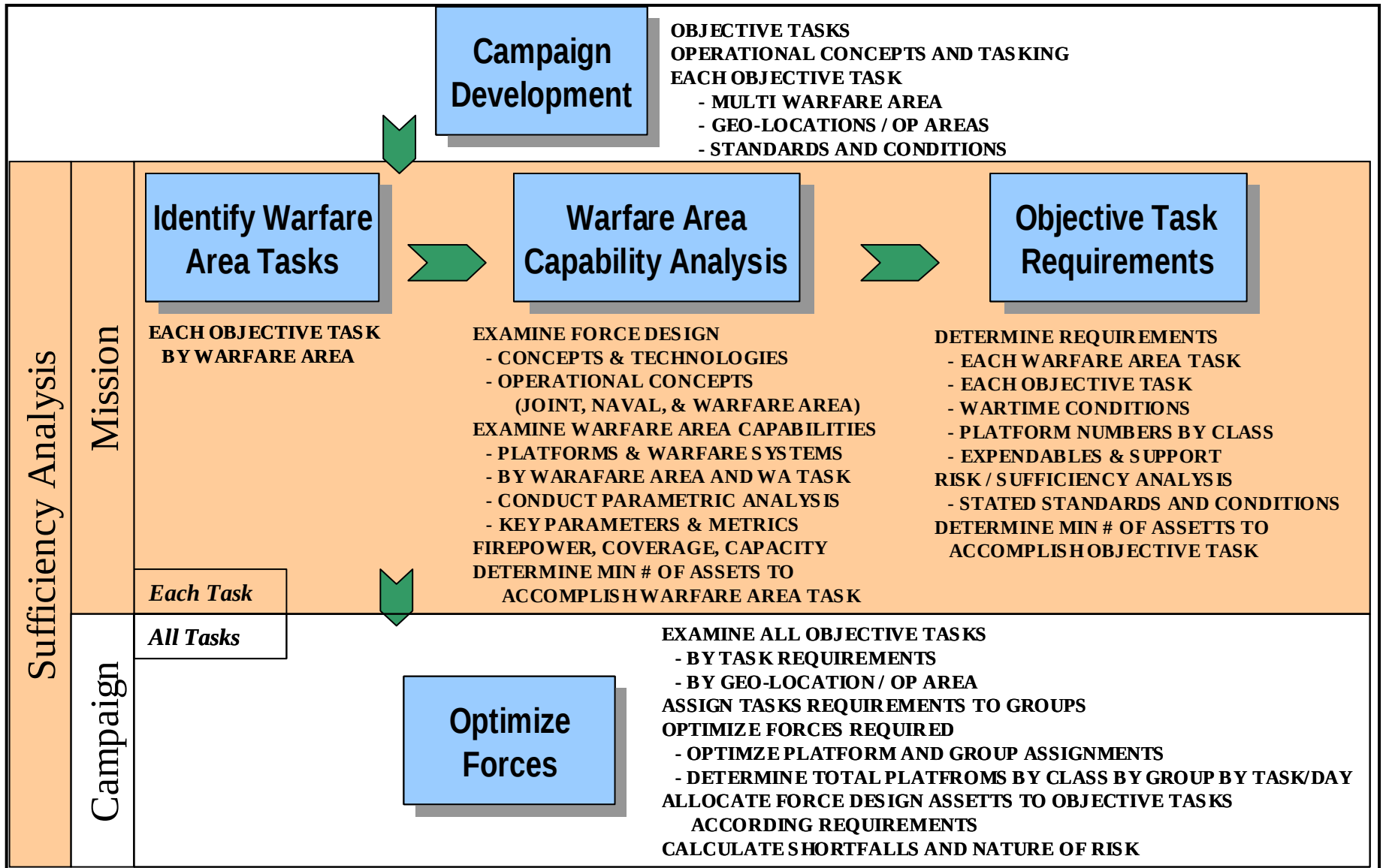
## Decision Support Analysis & Tools

- Need for Analysis Rigor. Focus on process, tools, data, and increased insight
- Force level analysis tools and process focus
- Maintain shipbuilding plans & databases for technology, combat systems, ship concepts, etc.
- Focus on force level spirals v. specific studies

# ***Force Assessment Key Elements***

- ◆ **Sufficiency Analysis**
- ◆ **Sufficiency Analysis Example**
- ◆ **Mission Capability Evolution Timelines**
- ◆ **Force Calculus**
- ◆ **Architecture Capability Assessment**

# Sufficiency Analysis



# Sufficiency Analysis Example

## Tasking Requirement: Peace Keeping

| Objective Task | Objective Location       | Warfare Area Tasks              | Preferred Force    |
|----------------|--------------------------|---------------------------------|--------------------|
| MS             | SCS                      | ASW                             | SSN / Arrays / MPA |
| MS             | IO                       | ASW                             | SSN / Arrays / MPA |
| MS             | Makassar St              | SUW, ASW, STK                   | CSG                |
| MS             | IO                       | SUW, ASW, STK                   | CSG                |
| MS             | UNCNF Zone 3             | SUW, ASW, STK                   | CSG                |
| PP             | UNCNF West Coast Sumatra | STK, SOF, Amphib                | MPG                |
| LFP            | Sea Base                 | Terminal                        | STK-SAG            |
| LFP/SPOD       | Banda Aceh               | SUW, ASW, MIW, Amphib, Terminal | ESG                |
| LFP/SPOD       | Sorong                   | SUW, ASW, MIW, Amphib, Terminal | ESG                |
| SLOC           | St of Malacca            | SUW, ASW, MIW, AAW              | LCS, MIW Sqdrn     |
| SLOC           | Makassar St              | SUW, ASW, MIW                   | LCS                |
| SLOC           | Sunda St                 | SUW, ASW, MIW                   | LCS                |
| TFP            | Sumatra                  | TBMD                            | TBMD-SAG           |
| TFP            | Java, Borneo             | TBMD                            | TBMD-SAG           |
| LFP            | Medan                    | Terminal                        | DDG (AD)           |
| LFP            | Jakarta                  | Terminal                        | DDG (AD)           |

### Sufficiency Analysis Example

SLOC = Joint Mission  
ASW/MIW = Naval Task

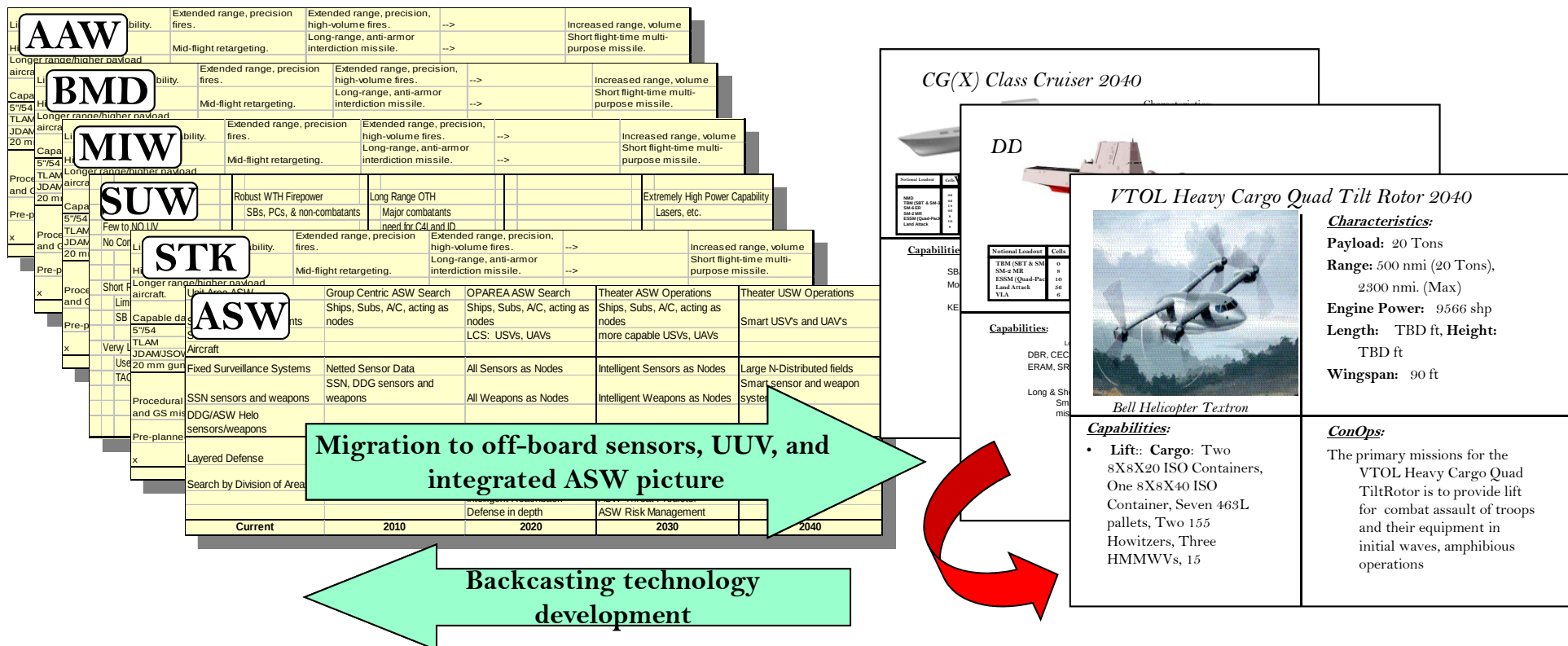
- WMA analysis determines asset requirements  
ASW task = 5 Assets (LCS)  
SUW task = 5 Assets (LCS)
- Task analysis determines 7 assets (LCS) can do the combined SLOC task
- Campaign SA for I+15 determines asset requirements for all tasks = 26 LCS
- Force Flow (I+15) = 20 Platforms
- Force Design = 56 Platforms

Tasks identified by campaign snapshot and assessed using a **sufficiency analysis** technique

**CAMPAIGN TASKING SETS THE CONDITIONS FOR THE ANALYSIS**

# Warfare Mission Analysis

## Mission Capability Evolution Timelines



Technologies, systems, platforms, concepts of operations, operational concepts, and rules of engagement set the basis for analysis and establish evolution of capability

## Force Calculus Shortfalls/Overages

# Force Structure and Flows

16

# ***Architecture Capability Assessment***

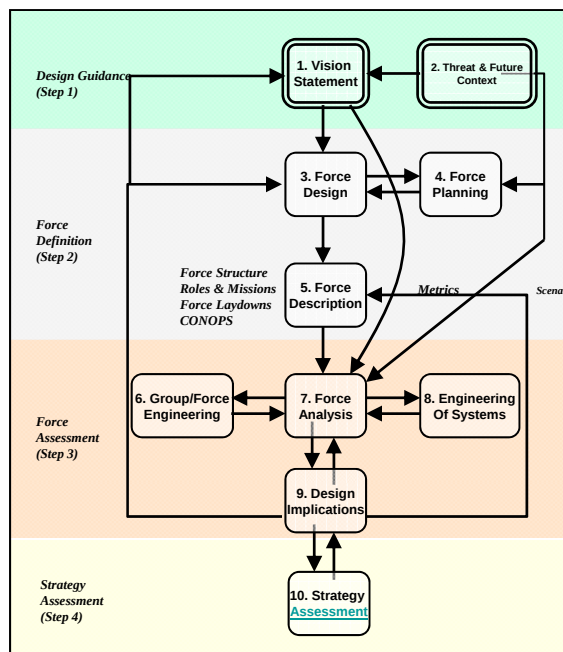
- ◆ **Collect Metrics for Baseline and Alternative Architectures**

- Mission Level
- Ship level
- Force level

- ◆ **Characterize Architectural Implications**

- In Terms Of Capability, Force Levels, and Cost
- Warfare Systems & Technologies
- Force Structure and Ship Concepts
- Cost Estimate and Overall Value
- Operational Philosophy

# Example: Future Force Formulation (F3) Summary Results



## Design Guidance

- World evolves to verge of multi-polar environment
- Global economy grows by 4x and seaborne trade by 6-8x. Resource scarcity significant.
- 8 potential areas of conflict in 2040

## Force Definition

- 2 Force design options – POR extended and FORCEnet/ Seabase. Both within cost construct (3% GDP growth).
- Technology roadmap and FORCEnet development
- FORCEnet gain not realized and automated ship concept introduced

## Force Assessment

- Neither force design stressed
- More escorts required for both designs due to dispersed operating areas
- Option 2 greater potential for technological growth

## Strategy Assessment

- Validated need for platforms
- Raised issues of long-term shipbuilding plan and build rates
- Identified potential gains in performance and reductions in cost if FORCEnet fully implemented
- Highlighted critical importance of long-range vision

Multiple future World Contexts & Economic Constraints

Systems Engineering Approach to Force Design

Sufficiency Analysis & Technology Roadmaps

Examination of Acquisition Implications

# ***Strategic Analysis of Naval Force Structure***

## **Tools and Models**

# *Tools and Models*

## ◆ **Force Structure Analysis Model (ForceSAM)**

- Analysis toolkit of legacy Force Structure and Affordability models
- Broad, consistent, and integrated treatment of information & tools

## ◆ **ForceSAM contains models, tools, and processes:**

- Force Acquisition & Inventory Model (FAIM) – Ship Acquisition Strategy model
  - Overview and Operation
  - Standard Products:
    - SCN Sandcharts; Bug Tables; Summaries by Ship Category
    - Shipbuilding Profiles (Procurement, Inventory, & Retirement Tables)
    - Shipyard Loading (open source data, scoped to support long range planning)
- eXtended Platform Interface (XPI) – Force Level Capacity Analysis
  - Tailored Group Analysis and Fleet Comparisons
- Maintenance, Modernization, & Repair (MMR)
- Ship Yard Loading Module

## ◆ **Other**

- Force Design & Presence Model; Fleet Affordability Model
- Force Presence Model & Surge Model; Force Calculus Tools
- Fleet Steady State Analysis

# ***FAIM Scope & Theme***

## ◆ **Scope:**

- Scoped to address factors driving strategic long range planning
- Models Entire Naval Force Levels, SCN, and Interactions
  - Integrated Ship Inventory and Budget Talley are the core elements
  - Repository of historical and current ships
- Primary Components:
  - Naval legacy: Inventory and planned retirement schedule
  - Shipbuilding plan: SCN procurement, retirements, cost, and schedule
- Supports Long Range Strategy and Provides Insight for Decision Makers
  - POM Baselines and Excursions

## ◆ **Theme -- Integrated Process & Tools**

- Support OPNAV force level drills (bug tables, SCN Sandcharts, etc.)
- Provide High Overall Utility and Flexibility for the Analyst
- Inventory and retirement management at hull level
- Modular Workbook Construction of Legacy Ships and Ship Building Plans (inventory and retirement management at the hull level)
- Consistent Reporting of Reports and Charts
- Excel look & feel with dynamic updates of analyst inputs
- Local and network capable

# Long Range Shipbuilding Strategy

## Develop & Examine Ship Acquisition Strategies

- Develop Alternative Ship Acquisition Strategies
- Analysis trade-space for senior leadership
- Iterate Alternatives to Optimize / Tailor
- Assessing risk; balancing capability, cost, and industrial base

### Capability

- **Requirements**
- **Force Structure**
  - CONOPS
    - Fwd Deployment
    - MCO's & GWOT
- **Force Assessment**
  - Utility & Flexibility
  - Fire Power, Coverage, & Capacity

### LRS Strategy

- Balance the Tenets
- Nature of Future Force
- Spectrum of Threat
- Methods & Tools

### Industrial Base

- Nuclear Base
- Ship Yard Loading
- Skill Levels
- Stable Rates
- Surge Capacity

- **Ship Design**
  - Cost Targets
  - Capability v. Cost
- **SCN Budget Goals**
- **Procurement Policy**
  - Stable Rates
  - Efficient Runs

### Procurement Profile & Cost

# FAIM: Inflation / Deflation Tables

| FAIM: Inflation / Deflation Tables |                                                |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |
|------------------------------------|------------------------------------------------|-------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------------------|---------|---------|-------------|-------------|
|                                    |                                                |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |
| 16                                 | <== Selected OSD Budget Year Index (BYI) Table |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |
| 15                                 | <== Selected SCI Budget Year Index (BYI) Table |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |
|                                    |                                                |             | FYDP Planning |         |         |         |         |         |         |         | Capability Planning |         |         |             |             |
| Scenario                           | Budget Factors                                 | SBP Factors | 2008          | 2009    | 2010    | 2011    | 2012    | 2013    | 2014    | 2015    | 2016                | 2017    | 2018    | 2019        | 2020        |
| 13                                 | (Realistic SCN)                                |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |
|                                    | [BudgetGoal]                                   | TY\$M       | 15100.0       | 15680.1 | 16259.6 | 16833.2 | 17422.3 | 18033.1 | 18666.8 | 19324.7 | 20006.8             | 20713.1 | 21444.3 | 22201.24533 | 22984.94929 |
|                                    | [BudgetGoal]                                   | CY\$M       | 15100.0       | 15100.0 | 15100.0 | 15100.0 | 15100.0 | 15100.0 | 15100.0 | 15100.0 | 15100.0             | 15100.0 | 15100.0 | 15100.0     | 15100.0     |
|                                    | [Deflation]                                    | [CONVRATIO] | 1.0000        | 0.9630  | 0.9287  | 0.8970  | 0.8667  | 0.8374  | 0.8089  | 0.7814  | 0.7547              | 0.7290  | 0.7042  | 0.6801      | 0.6570      |
|                                    | [Inflation]                                    | [INFLATION] | 1.0000        | 1.0384  | 1.0768  | 1.1148  | 1.1538  | 1.1942  | 1.2362  | 1.2798  | 1.3250              | 1.3717  | 1.4201  | 1.4703      | 1.5222      |
|                                    | Tina driven inflation index FY51 to FY70       |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |
| 14                                 | (OSD SCN)                                      |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |
|                                    | [BudgetGoal]                                   | TY\$M       | 15100.0       | 15402.0 | 15710.0 | 16024.2 | 16344.7 | 16671.6 | 17005.1 | 17345.2 | 17692.1             | 18045.9 | 18406.8 | 18774.95206 | 19150.4511  |
|                                    | [BudgetGoal]                                   | CY\$M       | 15100.0       | 15100.0 | 15100.0 | 15100.0 | 15100.0 | 15100.0 | 15100.0 | 15100.0 | 15100.0             | 15100.0 | 15100.0 | 15100.0     | 15100.0     |
|                                    | [Deflation]                                    | [CONVRATIO] | 1.0000        | 0.9804  | 0.9612  | 0.9423  | 0.9238  | 0.9057  | 0.8880  | 0.8706  | 0.8535              | 0.8368  | 0.8203  | 0.8043      | 0.7885      |
|                                    | [Inflation]                                    | [INFLATION] | 1.0000        | 1.0200  | 1.0404  | 1.0612  | 1.0824  | 1.1041  | 1.1262  | 1.1487  | 1.1717              | 1.1951  | 1.2190  | 1.2434      | 1.2682      |
|                                    | Tina driven inflation index FY61 to FY70       |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |
| 15                                 | (Realistic SCN)                                |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |
|                                    | [BudgetGoal]                                   | TY\$M       | 16371.0       | 17000.0 | 17628.3 | 18250.1 | 18888.7 | 19551.0 | 20238.1 | 20951.3 | 21690.9             | 22456.6 | 23249.3 | 24069.99951 | 24919.67049 |
|                                    | [BudgetGoal]                                   | CY\$M       | 17000.0       | 17000.0 | 17000.0 | 17000.0 | 17000.0 | 17000.0 | 17000.0 | 17000.0 | 17000.0             | 17000.0 | 17000.0 | 17000.0     | 17000.0     |
|                                    | [Deflation]                                    | [CONVRATIO] | 1.0384        | 1.0000  | 0.9644  | 0.9315  | 0.9000  | 0.8695  | 0.8400  | 0.8114  | 0.7837              | 0.7570  | 0.7312  | 0.7063      | 0.6822      |
|                                    | [Inflation]                                    | [INFLATION] | 0.9630        | 1.0000  | 1.0370  | 1.0735  | 1.1111  | 1.1501  | 1.1905  | 1.2324  | 1.2759              | 1.3210  | 1.3676  | 1.4159      | 1.4659      |
|                                    | Tina driven inflation index FY51 to FY70       |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |
| 16                                 | (OSD SCN)                                      |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |
|                                    | [BudgetGoal]                                   | TY\$M       | 16666.7       | 17000.0 | 17340.0 | 17686.8 | 18040.5 | 18401.3 | 18769.4 | 19144.8 | 19527.7             | 19918.2 | 20316.6 | 20722.90514 | 21137.36324 |
|                                    | [BudgetGoal]                                   | CY\$M       | 17000.0       | 17000.0 | 17000.0 | 17000.0 | 17000.0 | 17000.0 | 17000.0 | 17000.0 | 17000.0             | 17000.0 | 17000.0 | 17000.0     | 17000.0     |
|                                    | [Deflation]                                    | [CONVRATIO] | 1.0200        | 1.0000  | 0.9804  | 0.9612  | 0.9423  | 0.9238  | 0.9057  | 0.8880  | 0.8706              | 0.8535  | 0.8368  | 0.8203      | 0.8043      |
|                                    | [Inflation]                                    | [INFLATION] | 0.9804        | 1.0000  | 1.0200  | 1.0404  | 1.0612  | 1.0824  | 1.1041  | 1.1262  | 1.1487              | 1.1717  | 1.1951  | 1.2190      | 1.2434      |
|                                    | Tina driven inflation index FY61 to FY70       |             |               |         |         |         |         |         |         |         |                     |         |         |             |             |

Shipbuilding indices are unique based on tailored industry data, “Realistic” composite rates.

Inflation / deflation method are critical to calculating correct SCN

\* SCI deflated / OSD Inflated

# FAIM: Force Level Ship Costs

## “Ship Cost Projection” Method

|    | B                                                                                                                       | C            | D                     | E          | F                 | G          | H                                                                      | I          | J          | K          | L          | M          | N          | O                          | P          | O          | R          |
|----|-------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------|------------|-------------------|------------|------------------------------------------------------------------------|------------|------------|------------|------------|------------|------------|----------------------------|------------|------------|------------|
| 2  | <b>FAIM: Procurement Profiles (SCN Line Item vs. SCN average cost, procurement shift, and procurement distribution)</b> |              |                       |            |                   |            |                                                                        |            |            |            |            |            |            |                            |            |            |            |
| 3  |                                                                                                                         |              |                       |            |                   |            |                                                                        |            |            |            |            |            |            |                            |            |            |            |
| 4  |                                                                                                                         |              |                       |            |                   |            | <b>Procurement Profile as Percentage of Total Average Cost of Ship</b> |            |            |            |            |            |            |                            |            |            |            |
| 5  | <b>Ship Class</b>                                                                                                       |              |                       |            |                   |            |                                                                        |            |            |            |            |            |            | <b>Procurement Years %</b> |            |            |            |
| 6  | <b>Type</b>                                                                                                             | <b>Class</b> | <b>FAIM Line Item</b> | <b>SCN</b> | <b>ConstDelay</b> | <b>ESL</b> | <b>AP6</b>                                                             | <b>AP5</b> | <b>AP4</b> | <b>AP3</b> | <b>AP2</b> | <b>AP1</b> | <b>PY1</b> | <b>PY2</b>                 | <b>PY3</b> | <b>PY4</b> | <b>PY5</b> |
| 7  | CV                                                                                                                      | CVE          | CVE                   | 0          | 5                 | 50         |                                                                        |            | 2%         | 5%         | 19%        | 6%         | 34%        | 34%                        |            |            |            |
| 8  | CVN                                                                                                                     | CVN-21       | CVN-21                | 10200      | 7                 | 50         |                                                                        |            | 2%         | 14%        | 10%        | 6%         | 28%        | 22%                        | 12%        | 6%         |            |
| 9  |                                                                                                                         | CVN-21       | CVN-21 Lead           | 10200      | 7                 | 50         |                                                                        |            | 2%         | 14%        | 10%        | 6%         | 28%        | 22%                        | 12%        | 6%         |            |
| 10 | CG                                                                                                                      | CG(X)        | CG(X)                 | 4600       | 7                 | 35         |                                                                        |            |            | 8%         | 8%         | 4%         | 41%        | 39%                        |            |            |            |
| 11 |                                                                                                                         | CG(X)        | CG(X) Lead            | 7041       | 7                 | 35         |                                                                        |            |            | 3%         | 5%         | 4%         | 45%        | 43%                        |            |            |            |
| 12 | CG                                                                                                                      | CG(X)        | CG(X) Plus            | 2400       | 6                 | 35         |                                                                        |            |            |            |            |            | 100%       |                            |            |            |            |
| 13 |                                                                                                                         | CG(X)        | CG(X) Plus Lead       | 2600       | 6                 | 35         |                                                                        |            |            |            |            |            | 100%       |                            |            |            |            |
| 14 | DDG                                                                                                                     | DDG-1000     | DDG-1000              | 2410       | 5                 | 35         |                                                                        |            |            |            |            |            | 100%       |                            |            |            |            |
| 15 |                                                                                                                         | DDG-1000     | DDG-1000 Lead 1       | 3000       | 6                 | 35         |                                                                        |            |            |            |            |            | 100%       |                            |            |            |            |
| 16 |                                                                                                                         | DDG-1000     | DDG-1000 Lead 2       | 3000       | 7                 | 35         |                                                                        |            |            |            |            |            | 100%       |                            |            |            |            |
| 17 |                                                                                                                         | DDG(X)       | DDG(X)                | 1975       | 5                 | 40         |                                                                        |            |            |            |            | 1%         | 99%        |                            |            |            |            |
| 18 |                                                                                                                         | DDG-51       | DDG-51                | 1400       | 4                 | 40         |                                                                        |            |            |            |            | 2%         | 98%        |                            |            |            |            |
| 19 |                                                                                                                         | DDG-51       | DDG-51FltIIA          | 1765       | 4                 | 40         |                                                                        |            |            |            |            |            | 100%       |                            |            |            |            |
| 20 |                                                                                                                         | FSC          | FSC                   | 1985       | 4                 | 40         |                                                                        |            |            |            |            | 2%         | 98%        |                            |            |            |            |
| 21 | LCS                                                                                                                     | LCS          | LCS                   | 480        | 3                 | 25         |                                                                        |            |            |            |            |            | 100%       |                            |            |            |            |
| 22 |                                                                                                                         | LCS          | LCS Lead              | 250        | 3                 | 25         |                                                                        |            |            |            |            |            | 100%       |                            |            |            |            |
| 23 |                                                                                                                         | LCS          | LCS(X)                | 400        | 3                 | 25         |                                                                        |            |            |            |            |            | 100%       |                            |            |            |            |
| 24 |                                                                                                                         | LCS          | LCS(X) Lead           | 750        | 3                 | 25         |                                                                        |            |            |            |            |            | 100%       |                            |            |            |            |

Nominal distribution of Ship Costs by ship class

# FAIM: Primary Shipbuilding Interface

## Principle Shipbuilding Model for Navy

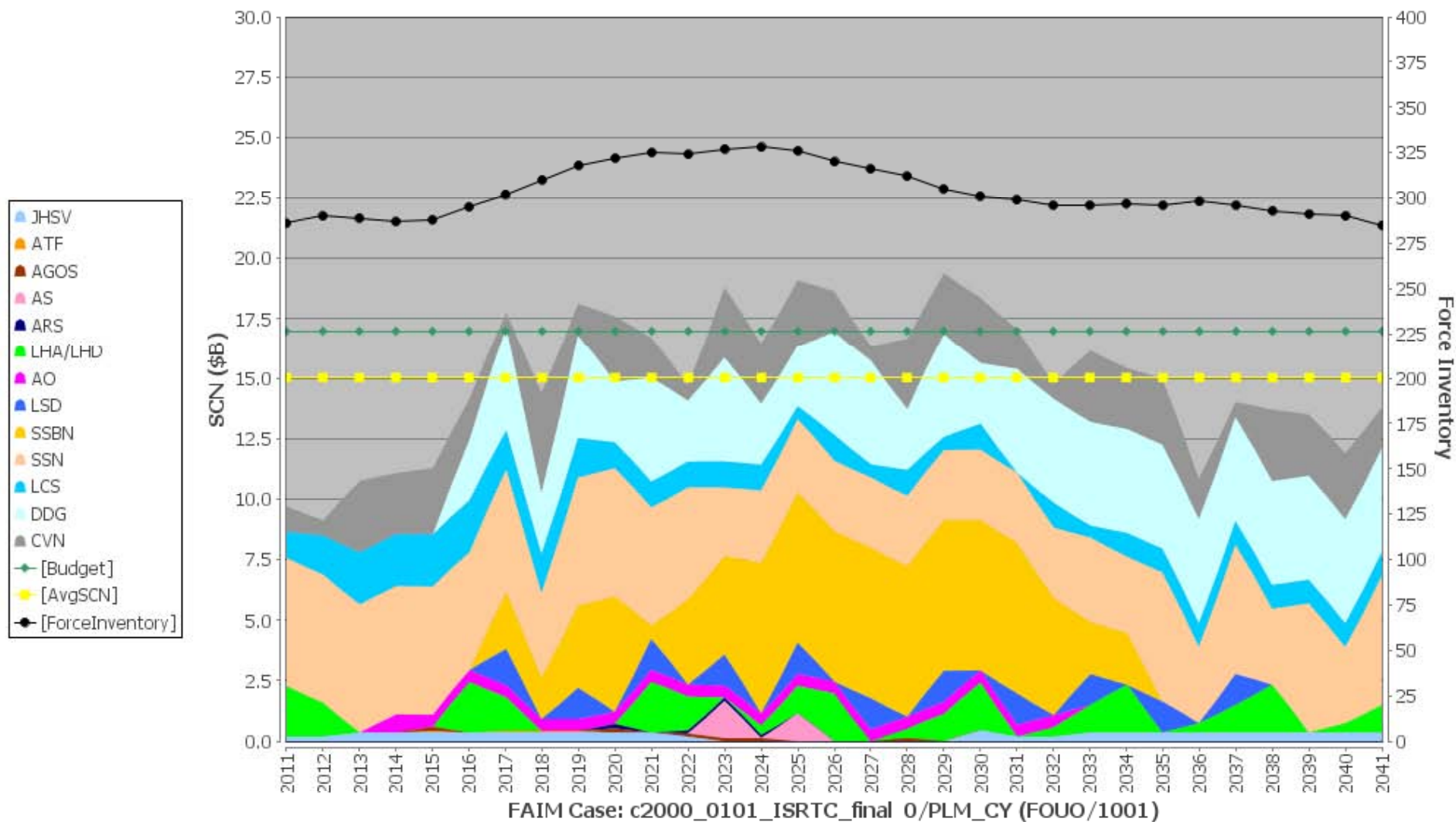
| Ship Classification |      |        | Ship Factors            |                      |     |               | FAIM        | FYDP |        |      |      |      |      |      | Capability Pla |     |
|---------------------|------|--------|-------------------------|----------------------|-----|---------------|-------------|------|--------|------|------|------|------|------|----------------|-----|
| Category            | Type | Class  | FAIM Line Item          | Comm                 | ESL | PSL           | Factors     | 2011 | 2012   | 2013 | 2014 | 2015 | 2016 | 2017 | 2018           |     |
| Amphib              | LPD  | LPD-17 | LPD-17                  | 2005                 | 40  | 40            | Legacy      | 7    | 8      | 9    | 10   | 11   | 12   | 13   | 14             |     |
| Legacy Force        |      |        | LPD-18                  | 2007                 | 40  | 40            |             | 5    | 6      | 7    | 8    | 9    | 10   | 11   | 12             |     |
|                     |      |        | LPD-19                  | 2007                 | 40  | 40            |             | 5    | 6      | 7    | 8    | 9    | 10   | 11   | 12             |     |
|                     |      |        | LPD-20                  | 2008                 | 40  | 40            |             | 4    | 5      | 6    | 7    | 8    | 9    | 10   | 11             |     |
|                     |      |        | LPD-21                  | 2009                 | 40  | 40            |             | 3    | 4      | 5    | 6    | 7    | 8    | 9    | 10             |     |
|                     |      |        | LPD-22                  | 2011                 | 40  | 40            |             | 1    | 2      | 3    | 4    | 5    | 6    | 7    | 8              |     |
|                     |      |        | LPD-23                  | 2012                 | 40  | 40            |             |      | 1      | 2    | 3    | 4    | 5    | 6    | 7              |     |
|                     |      |        | LPD-24                  | 2012                 | 40  | 40            |             |      | 1      | 2    | 3    | 4    | 5    | 6    | 7              |     |
|                     |      |        | [ClassCommisioned]      |                      |     | [Commisioned] | 1           | 2    | 0      | 0    | 0    | 0    | 0    | 0    |                |     |
|                     |      |        | [ClassRetired]          |                      |     | [Retired]     | 0           | 0    | 0      | 0    | 0    | 0    | 0    | 0    |                |     |
|                     |      |        | [ClassInventory]        |                      |     | [Inventory]   | 6           | 8    | 8      | 8    | 8    | 8    | 8    | 8    |                |     |
| Amphib              | LPD  | LPD-17 | LPD-17                  |                      |     | Procured      |             | 1    |        |      |      |      |      |      |                |     |
| Acquisition Plan    |      |        | Procurement Cat => New  | Shift => 4           |     |               | Commisioned |      |        |      |      |      |      |      |                |     |
|                     |      |        | Procurment Type => Ship | ESL => 40            |     |               | Retired     |      |        |      |      |      |      |      |                |     |
|                     |      |        |                         | Planning Method      |     |               | AveShip_CY  |      |        |      |      |      |      |      |                |     |
|                     |      |        |                         |                      |     |               | APandOther  |      |        |      |      |      |      |      |                |     |
|                     |      |        |                         | Cost Analyst Methods |     | CAM1          | CAM1_TY     |      |        |      |      |      |      |      |                |     |
|                     |      |        |                         |                      |     |               | CAM1_CY     |      |        |      |      |      |      |      |                |     |
|                     |      |        |                         |                      |     | CAM2          | CAM2_CY     | 0.0  | 1700.0 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0            | 0.0 |
|                     |      |        |                         |                      |     |               | CAM2_TY     |      |        |      |      |      |      |      |                |     |
|                     |      |        | [ClassProcured]         |                      |     | [Procured]    | 0           | 1    | 0      | 0    | 0    | 0    | 0    | 0    |                |     |
|                     |      |        | [ClassCommisioned]      |                      |     | [Commisioned] | 0           | 0    | 1      | 0    | 1    | 1    | 0    | 0    |                |     |
|                     |      |        | [ClassRetired]          |                      |     | [Retired]     | 0           | 0    | 0      | 0    | 0    | 0    | 0    | 0    |                |     |
|                     |      |        | [ClassInventory]        |                      |     | [Inventory]   | 6           | 8    | 9      | 9    | 10   | 11   | 11   | 11   |                |     |

*Influence Naval Force Structure (what we buy, how many, & capability delivered)*

# FAIM: Example Output

## SCN v. Naval Force Sandchart

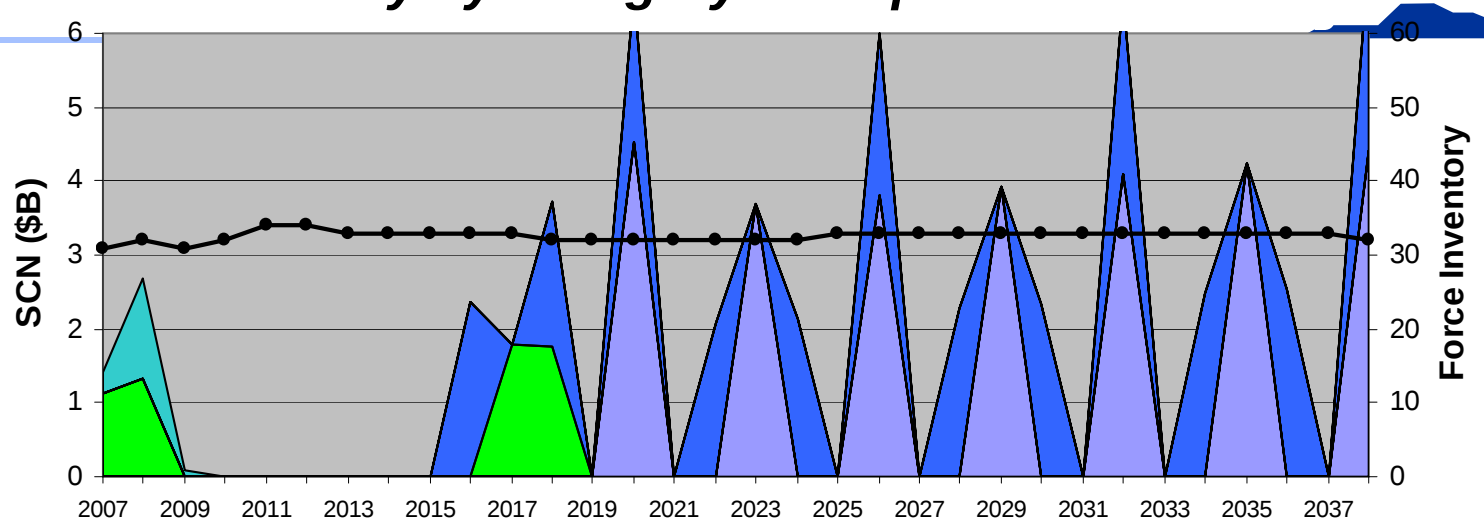
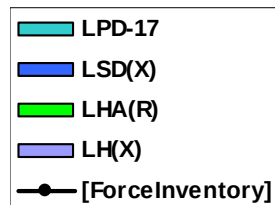
ct\FAIMSCNvsSFView: FAIM Case: c2000\_0101\_ISRTC\_final 0\PLM\_CY (FOUO/1001)



FOUO // 17 row(s) // 32 col(s)

# FAIM: Example Output

## Summary by Category -- Amphib



|        |         |            |        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
|--------|---------|------------|--------|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Amphib | LPD     | [Procured] | LPD-17 |   | 1 |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|        | LSD     | [Procured] | LSD(X) |   |   |   |    |    |    |    |    |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |
|        | LHA/LHD | [Procured] | LHA(R) | 1 |   |   |    |    |    |    |    |    |    |    | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|        |         |            | LH(X)  |   |   |   |    |    |    |    |    |    |    |    |    |    | 1  |    |    | 1  |    |    | 1  |    |    | 1  |    |    | 1  |    |    | 1  |    |    | 1  |
| Total  |         |            |        | 1 | 1 |   |    |    |    |    |    |    | 1  | 1  | 1  |    | 2  |    | 1  | 1  | 1  |    | 2  |    | 1  | 1  | 1  |    | 2  |    | 1  | 1  | 1  |    | 2  |

|        |         |             |        | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |   |
|--------|---------|-------------|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| Amphib | LPD     | [Retired]   | LPD-4  | -3 |    | -2 |    |    | -2 | -1 |    |    |    |    | -1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|        |         | [Delivered] | LPD-17 | 2  | 1  | 1  | 1  | 2  | 1  |    |    |    |    |    |    |    | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|        |         | [Inventory] | LPD-4  | 6  | 6  | 4  | 4  | 4  | 2  | 1  | 1  | 1  | 1  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|        |         |             | LPD-17 | 3  | 4  | 5  | 6  | 8  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  |   |
|        | LSD     | [Retired]   | LSD-41 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | -1 | -1 | -1 | -1 |    | -2 |    | -1 |    | -1 |    | -1 |    |   |
|        |         | [Delivered] | LSD(X) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1  | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    | 1  |    |   |
|        |         | [Inventory] | LSD-41 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 11 | 10 | 9  | 8  | 8  | 6  | 6  | 5  | 5  | 4  | 4  | 3  | 3  |   |
|        |         |             | LSD(X) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1  | 2  | 2  | 3  | 3  | 4  | 4  | 5  | 5  | 6  | 6  | 7  | 7  | 8  | 8  | 9  | 9  |   |
|        | LHA/LHD | [Retired]   | LHA-1  | -1 |    | -1 |    |    |    |    |    |    |    |    |    |    |    | -1 | -1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|        |         |             | LHD-1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|        |         | [Delivered] | LHD-8  |    |    | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|        |         |             | LHA(R) |    |    |    |    |    | 1  |    |    |    |    |    |    |    |    |    | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|        |         |             | LH(X)  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1  |    | 1  |    |    | 1  |    |    |    |    |    | 1  |    |   |
|        |         | [Inventory] | LHA-1  | 3  | 3  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|        |         |             | LHD-1  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 7  | 6  | 6  | 6  | 5  | 4 |
|        |         |             | LHD-8  |    |    | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|        |         |             | LHA(R) |    |    |    |    |    |    | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  |   |
|        |         |             | LH(X)  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1  | 1  | 2  | 2  | 2  | 3  | 3  | 3  | 4  | 4  | 4  | 5  | 5  |   |
| Total  |         |             |        | 31 | 32 | 31 | 32 | 34 | 34 | 33 | 33 | 33 | 33 | 33 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 32 |   |



# FAIM: Example Output

## Force Inventory v. Requirements Bug Table

| BFRReqBug1 |              | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | Req | 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  | 31  | 32  | 33  | 34  | 35  | 36  | 37  |    |
|------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Carrier    | CV           | 1   | 1   |     |     |     |     | 0   | 0   |     |     |     |     |     |     | 11  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|            | CVN          | 10  | 10  | 11  | 11  | 11  | 11  | 10  | 10  | 11  | 11  | 11  | 11  | 12  | 12  |     | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  |    |
|            | Total        | 11  | 11  | 11  | 11  | 11  | 11  | 10  | 10  | 11  | 11  | 11  | 11  | 12  | 12  | 11  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  |    |
| Surface Co | FFG          | 30  | 30  | 30  | 29  | 29  | 26  | 21  | 13  | 6   | 3   | 1   | 1   |     |     | 0   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|            | CG(47)       | 22  | 22  | 22  | 22  | 22  | 22  | 22  | 22  | 22  | 22  | 22  | 22  | 22  | 22  | 19  | 21  | 18  | 16  | 14  | 11  | 7   | 4   | 1   |     |     |     |     |     |     |     |     |     |    |
|            | CG(X)        |     |     |     |     |     |     |     |     |     |     | 1   | 1   | 2   | 3   |     | 7   | 9   | 11  | 13  | 15  | 17  | 18  | 19  | 19  | 19  | 19  | 19  | 19  | 19  | 19  | 19  |     |    |
|            | DDG-51       | 52  | 53  | 57  | 60  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  | 62  |    |
|            | DDG(X)       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 1   | 1   | 3   | 6   | 9   | 12  | 15  | 18  | 21  | 24  | 27  |    |
|            | DDG-1000     |     |     |     |     |     |     | 2   | 2   | 4   | 5   | 6   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   |    |
|            | LCS          |     | 2   | 2   | 2   | 2   | 3   | 8   | 11  | 14  | 18  | 24  | 30  | 36  | 42  | 55  | 41  | 54  | 55  | 55  | 55  | 55  | 55  | 55  | 55  | 55  | 55  | 55  | 55  | 55  | 55  | 55  | 55  |    |
|            | Total        | 104 | 107 | 111 | 113 | 115 | 113 | 115 | 110 | 108 | 110 | 116 | 123 | 129 | 136 | 143 | 148 | 148 | 149 | 149 | 148 | 146 | 146 | 144 | 146 | 149 | 151 | 154 | 156 | 155 | 153 | 150 | 149 |    |
| Sub        | SSN          | 53  | 52  | 53  | 52  | 52  | 53  | 54  | 51  | 51  | 49  | 50  | 49  | 50  | 49  | 48  | 48  | 47  | 47  | 46  | 45  | 44  | 43  | 41  | 41  | 41  | 43  | 43  | 43  | 43  | 43  | 43  | 43  |    |
|            | SSN-774(X)   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1   | 2   | 4   | 6   | 7   | 9   | 10  |    |
|            | SSGN         | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 2   | 1   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |    |
|            | SSBN         | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 13  | 13  | 13  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  |    |
|            | Total        | 71  | 70  | 71  | 70  | 70  | 71  | 72  | 69  | 69  | 67  | 68  | 67  | 68  | 68  | 66  | 66  | 65  | 65  | 64  | 63  | 60  | 57  | 54  | 54  | 54  | 56  | 57  | 59  | 61  | 62  | 64  | 65  |    |
| Amphib     | LPD          | 9   | 10  | 9   | 10  | 12  | 11  | 10  | 10  | 10  | 10  | 10  | 9   | 9   | 9   | 10  | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   |    |
|            | LSD          | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 13  | 14  | 14  | 15  | 14  | 14  | 13  | 13  | 13  | 12  | 12  | 12  | 12  | 12  | 12  | 12  |    |
|            | LHA/LHD      | 10  | 10  | 10  | 10  | 10  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 9   | 11  | 10  | 9   | 9   | 9   | 10  | 10  | 11  | 11  | 11  | 12  | 12  | 12  | 12  | 12  | 12  | 12  |    |
|            | Total        | 31  | 32  | 31  | 32  | 34  | 34  | 33  | 33  | 33  | 33  | 33  | 32  | 32  | 32  | 31  | 32  | 32  | 32  | 32  | 33  | 33  | 33  | 33  | 33  | 33  | 33  | 33  | 33  | 33  | 33  | 33  | 33  |    |
| CLF        | T-AFS        | 5   | 3   |     |     |     |     |     |     |     |     |     |     |     |     | 0   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|            | T-AO         | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  | 15  |     |    |
|            | T-AOE        | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   |     |    |
|            | T-AE         | 5   | 5   | 5   | 3   |     |     |     |     |     |     |     |     |     |     | 0   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|            | T-AKE        | 3   | 5   | 8   | 9   | 10  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  |     |    |
|            | Total        | 31  | 31  | 31  | 30  | 28  | 29  | 29  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  |    |
| Mine       | MHC/MCM      | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 13  | 13  | 11  | 10  | 0   | 7   | 6   | 2   | 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|            | Total        | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 14  | 13  | 13  | 11  | 10  | 0   | 7   | 6   | 2   | 1   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |    |
| MPF(F)     | LHA/LHD      |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 3   | 0   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |     |    |
|            | MPFA         |     |     |     |     |     |     |     |     | 1   | 1   | 1   | 1   | 2   |     | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   |    |
|            | MPFD         |     |     |     |     |     |     |     |     | 2   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   |    |
|            | MPF(F) T-AKE |     |     |     |     |     |     | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 3   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |    |
|            | MPFC         |     |     |     |     |     |     |     |     |     |     | 1   | 2   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   |    |
|            | Total        | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1   | 2   | 4   | 6   | 7   | 9   | 12  | 9   | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  |    |
| Cmd & Sup  | T-ARS        | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   |     |    |
|            | AS           | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   |    |
|            | T-AGOS       | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 4   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   |    |
|            | JHSS         |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 1   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |    |
|            | T-ATF        | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   |    |
|            | Command      | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 3   | 4   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   |    |
|            | JHSV         |     |     |     |     |     | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 7   | 7   | 3   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   |    |
|            | Total        | 17  | 17  | 17  | 17  | 17  | 18  | 19  | 20  | 21  | 22  | 24  | 26  | 24  | 24  | 20  | 24  | 24  | 24  | 24  | 24  | 24  | 24  | 24  | 24  | 24  | 24  | 24  | 24  | 24  | 24  | 24  | 24  | 24 |
| Total      |              | 279 | 282 | 286 | 287 | 289 | 290 | 293 | 287 | 288 | 291 | 301 | 309 | 315 | 319 | 313 | 323 | 327 | 324 | 322 | 320 | 315 | 312 | 307 | 309 | 312 | 316 | 320 | 324 | 325 | 324 | 323 | 323 |    |

16.1:5.0:2008030464126 Legend: White: In Transition Red: Below 2020 Requirement Green: Meets 2020 Requirement Purple: Exceeds 2020 Requirement

Assess impact of shipbuilding plan to meeting established force level requirements

# FAIM Analysis Take Aways

## ◆ Thousand moving pieces

- Legacy, Retirements, Procurements, & Commissions
- Design scope is for 7-30+ year window
  - Budget fidelity in FYDP to ship cost “projections” for mid- & far-term
- Procurement strategies within class and across fleet for 300 ships

## ◆ Factors that drive analysis and response time

- Changes to cost, procurement schedule, retirements
  - Quick for a given run or excursion from baseline
  - Alternative shipbuilding plans easily developed
- Increased fidelity and detail increase level of effort (cost controls in FYDP)
  - Cost basis may effect multiple runs or baseline
  - Maintain configuration control over baselines and excursions

- Establish factors early and develop balanced shipbuilding plans using established criteria  
*ex. \$13B, \$15B, & \$17B balanced fleets)*

Versus

- Doing budget fidelity analysis in FYDP has impacts across upstream cases

# ***eXtended Platform Information (XPI)***

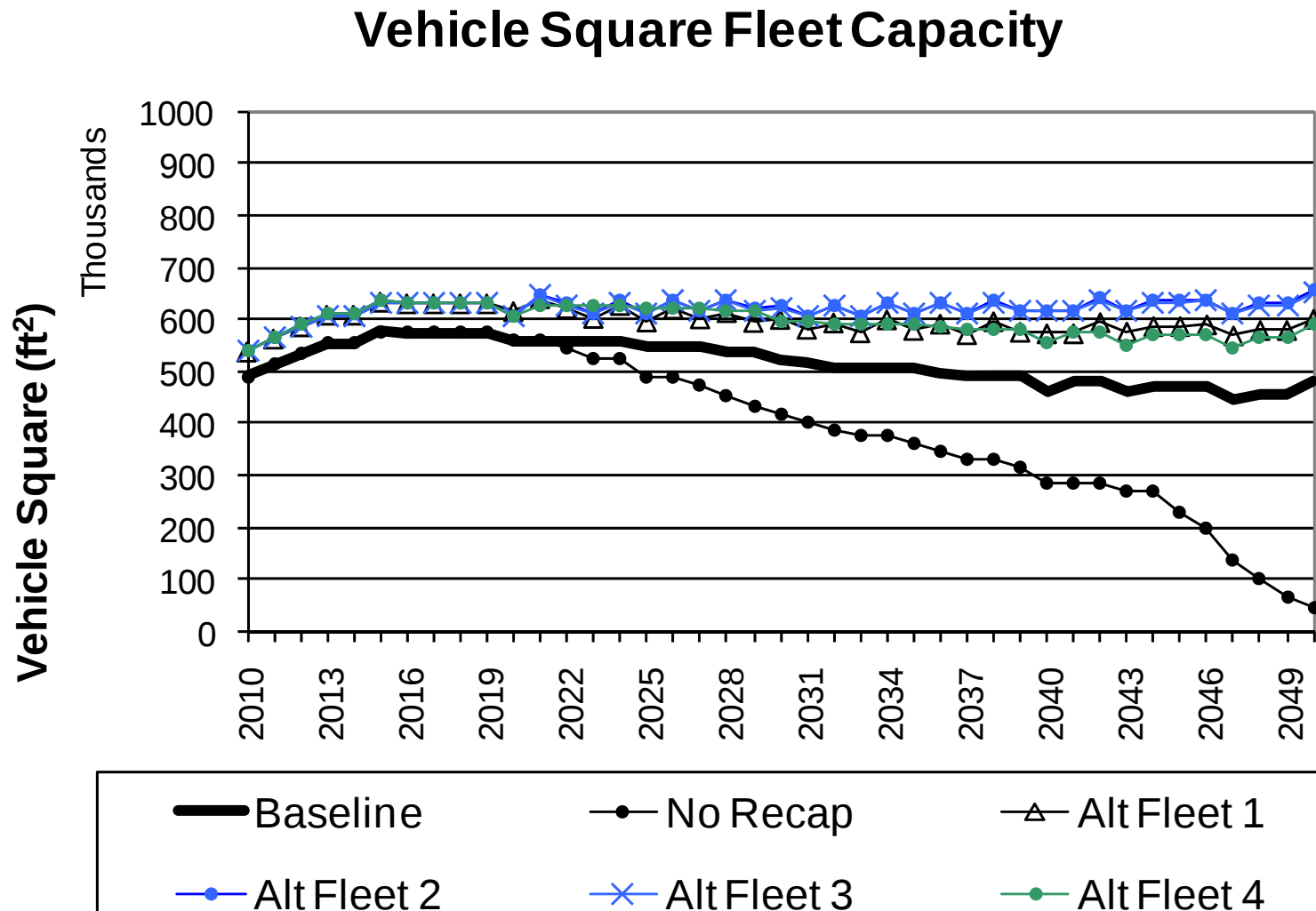
## ◆ **Force Level Capacity of Future Fleet Architectures**

- Ship Characterizations for Ships & Ship Concepts
  - Capacities, performance, & dimensional data
  - Scoped to support force level analysis (i.e. at ship class)
- XPI is a module of ForceSAM with force structure input from FAIM
- Tied to FAIM for shipbuilding plan input
- Rapid evaluation of force structure changes

## ◆ **Identify and Configure Control Ship Feature Data**

- Supports library/database for 05D1 configuration control
- Supports studies/analysis with standing database

# XPI Report: Fleet Capacity Example



In progress: updating ship data / fleet capacities

# Summary

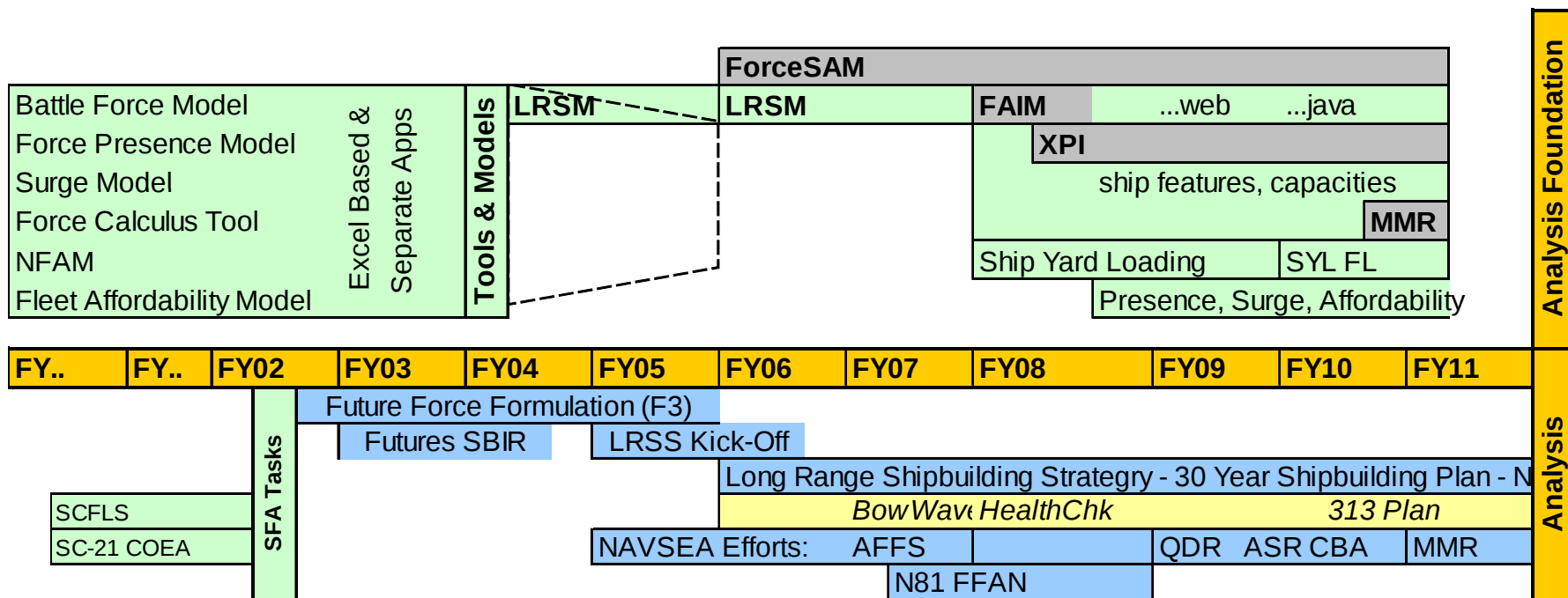
- ◆ **Strategic analysis is relevant to naval force structure analysis**
  - Current events, global and national uncertainty
  - Support OPNAV ship acquisition strategies
    - Long Range Shipbuilding Strategy (LRSS); Annual Report to Congress
    - AoA's & CBA's
  - Supports need to make near term decisions
- ◆ **Flexible framework and consistent methodology**
  - Maintain the force level scope required to be responsive and provide value
  - Hierarchical iterative across and recursive within phases as necessary
  - Phases identify the force level areas and context
  - Focus on key factors to provide clear insight into force architecture performance and value at the force level
  - Sufficiency analysis focuses on firepower / coverage / capacity
    - Modular, stepwise elements; rapid iterations
  - Conduct analysis and align with SMEs and Operational community
    - ship data, ship concepts, affordability, costing, force analysis

# NSWCDD Efforts and Alignment

## Influence Naval Force Structure

- What we buy
- How many
- Capability delivered

## Tool and Processes



## Support Various Force Structure Analysis

# *Way Ahead*

## ♦ **Continue to support NAVSEA and OPNAV studies**

- NAVSEA & Labs have unique assess and expertise
  - SMEs, combat systems, technology, ship concepts, cost, and force architectures
  - Tools and model development
  - Analysis rigor
- Continue to socialize Naval Force Structure Analysis and value to near-term decisions

## ♦ **Force level focus needed to provide decision support analysis, tools, expertise, and data**

- Focus on iteration of force designs and process improvement
- Develop force structure trade-space for senior leadership
- Maintain shipbuilding plans & databases for technology, combat systems, technology, ship concepts, and force architectures

# ***Backup Slides***

# ***Sufficiency Analysis Benefits***

- ◆ **Operational Analysis Input with Output expressed as Capability and Inventory Requirements**
- ◆ **Results Expressed in Terms Directly Useful to Acquisition Planning**
  - Ship Classes by Capability by Numbers Required
  - Utility and Flexibility of Design Features in Meeting Operational Tasking
- ◆ **Applies Warfare Area Expertise to Satisfy Operational Tasking**
  - ◆ Focus on Key Parameters that Drive Capability; Clear Insights
- ◆ **Broad Scope**
  - Evolving Roles and Missions; Long-term DoD Budget Profiles
  - Employment and Deployment Policies
  - Investment and Operation Costs
  - Peacetime and Wartime Requirements Analysis
- ◆ **Hierarchical Analysis Methodology**
  - Straightforward, Transparent Techniques
  - Modular, Stepwise Elements; Rapid Iterations, Easy Optimization

# Warfare Area Task Set

## ♦ Surface Warfare (SUW)

- Escort HVU
  - Through Choke Points, In Transit
- Protect Joint Operating Areas
  - Op Area
  - SLOC/Transit Lane
  - Protect Port
- Engage Surface Targets
  - Long Range, Short Range

## ♦ Air Warfare (AW)

- Forward Air Dominance / Establish Air Barriers
  - Outer Air Defense
  - LA Cruise Missile Defense
- Area Air Dominance
- Self-Defense

## ♦ Strike

- Strategic Strike
- Interdiction
- Fire Support

## ♦ BMD

- Theater BMD
- Area BMD

## ♦ Anti-Submarine Warfare (USW)

- Protect Forces In Transit
- Establish Barriers and Protect the JOA
  - Op Area
  - SLOC/Transit Lane
  - Port Protection
- Track and Trail/Attack Detected Targets (Subs & HVU's)
- Deliver SOF

## ♦ Mine Warfare (MIW)

- Escort Forces
  - Through Choke Points & SLOCs
  - In Transit
- Establish and Maintain Mine-Cleared Areas
  - SLOC/Transit Lane
  - Op Area
  - Port Protection
- Establish & Maintain Minefields
  - Op Area
  - Port Protection

# Warfare Area Task Matrix

| Warfare Area | Warfare Area Tasks                        | Conditions                        |                                                      |                                                             |                                                                         | Standards          |                  |
|--------------|-------------------------------------------|-----------------------------------|------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------|--------------------|------------------|
|              |                                           | Threats                           | Environments                                         | Dimensions                                                  | ISR Available                                                           | MOEs               | Success Criteria |
| AAW          | Cruise Missile Defense                    |                                   |                                                      |                                                             |                                                                         |                    |                  |
| AAW          | Outer Air Battle                          |                                   |                                                      |                                                             |                                                                         |                    |                  |
| AAW          | Terminal Defense                          |                                   |                                                      |                                                             |                                                                         |                    |                  |
| ASW          | Establish Barriers and Protect the JOA    | Diesel Subs, SSN's                | Water Depth, Salinity, White Traffic Density, Season | OpAreas: (30 x 30 nm);<br>SLOCs: (200 x 0.5 nm)             | Sensor Arrays                                                           | Pd                 | Pd = 0.90        |
| ASW          | Protect Forces In Transit                 | Diesel Subs, SSN's                | Water Depth, Salinity, White Traffic Density, Season | Convoy: (5nm x 10nm)                                        | Sensor Arrays                                                           | Pd                 | Pd = 0.90        |
| ASW          | Protect Ports                             | Diesel Subs, SSN's                | Water Depth, Salinity, White Traffic Density, Season |                                                             |                                                                         |                    |                  |
| BMD          | Area BMD                                  |                                   |                                                      |                                                             |                                                                         | # of Leakers       |                  |
| BMD          | Theater BMD                               |                                   |                                                      |                                                             |                                                                         | # of Leakers       |                  |
| MIW          | Escort: Transit                           | Bottom, Moored, and Surface Mines | Water Clarity and Depth                              |                                                             | Bottom Mapping, Undersea Sensor Array Detection of Mine-Laying Activity | time to clear area | 7 days           |
| MIW          | Establish and Maintain Mine Cleared Areas | Top Moored, and Surface Mines     | Water Clarity and Depth                              | OpAreas: (30 x 30 nm);<br>SLOC/Transit Lane: (200 x 0.5 nm) | Bottom Mapping, Undersea Sensor Array Detection of Mine-Laying Activity | time to clear area | 7 days           |

# Future Force Formulation

## Mission Analysis Highlights

- **For each warfare area** – Overall assessment of performance
- **Snapshot (D, D+3, D+10, D+30)** – Assessment of performance and adequacy of force flow
- **Force Level** – Overall assessment of performance and adequacy of force design
- **Comparative Analysis** – Comparison of cost, performance and adequacy of Option 1 and Option 2

|                            | Option 1                                                                                                                                                                                                                                                                       | Option 2                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S<br>t<br>r<br>i<br>k<br>e | <ul style="list-style-type: none"> <li>♦ DDX with rail guns, manned AC and UV</li> <li>♦ Seabase supports Marines Ashore (ESG, CSG, MPF(F))</li> <li>♦ Fire support and Interdiction required 1DDX and ½ CVN</li> <li>♦ 50% SAM sites still up 2<sup>nd</sup> day</li> </ul>   | <ul style="list-style-type: none"> <li>♦ Battery ship with rail guns, Manned AC &amp; UV</li> <li>♦ Seabase supports Marines ashore (MNF -- CVN, DDG(AD), LES, LLP, &amp; Battery Ship)</li> <li>♦ Fire support and Interdiction required 1LES (TACAIR configured) &amp; 1 battery ship</li> <li>♦ Fn substantially reduces risk to A/C (4% SAM sites still up 2<sup>nd</sup> day)</li> </ul> |
| T<br>B<br>M                | <ul style="list-style-type: none"> <li>♦ CG(X) and DDG(AD); req locations is force driver</li> <li>♦ 63 missiles fired, 5 leakers</li> <li>♦ Organic sensors and engagement</li> <li>♦ Sufficient missiles in theater</li> </ul>                                               | <ul style="list-style-type: none"> <li>♦ CG(X) &amp; DDG(AD), required locations is force driver</li> <li>♦ 57 missiles fired, 0.6 leakers</li> <li>♦ Fn enabled DOF of 2 for mid-course defense</li> <li>♦ Sufficient missiles in theater</li> </ul>                                                                                                                                         |
| A<br>A<br>W                | <ul style="list-style-type: none"> <li>♦ SM-6 and SM-2 follow-on missiles</li> <li>♦ 119 missiles fired, 17 ASCM leakers in area AD</li> <li>♦ Organic sensors and engagement (DOF of 1)</li> <li>♦ Sufficient area AD missiles in theater</li> </ul>                          | <ul style="list-style-type: none"> <li>♦ Extended range, pass-forward concept w/SM-6 for outer air battle freeing manned AC</li> <li>♦ 104 missiles fired, 6 ASCM leakers in area AD</li> <li>♦ Fn enabled DOF &gt; 1 except for ASCM category</li> <li>♦ Greater detection and higher Pk when DOF=1</li> <li>♦ Sufficient area AD missiles in theater</li> </ul>                             |
| A<br>S<br>W                | <ul style="list-style-type: none"> <li>♦ UV control from LCS</li> </ul>                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>♦ UV control from LCS</li> <li>♦ Fn comms and control enables wider separation of UV's reducing LCS requirements</li> </ul>                                                                                                                                                                                                                            |
| S<br>U<br>W                | <ul style="list-style-type: none"> <li>♦ Decentralized UV control results in need for more LCS platforms</li> <li>♦ Small boats and high vol white shipping concerns</li> <li>♦ Small boat "breakout" detected by organic sensors</li> <li>♦ UV spacing 8 nmi apart</li> </ul> | <ul style="list-style-type: none"> <li>♦ Centralized UV control reduces LCS platform requirements</li> <li>♦ Small boats and high vol white shipping concerns</li> <li>♦ Fn enables quicker/more effective response w/UVs</li> <li>♦ UV vehicles spacing 12.5 nmi apart</li> </ul>                                                                                                            |
| M<br>I<br>W                | <ul style="list-style-type: none"> <li>♦ Navigation accuracy 7m</li> <li>♦ False targets 8 per nmi<sup>2</sup></li> <li>♦ Mine clearance requires days</li> </ul>                                                                                                              | <ul style="list-style-type: none"> <li>♦ Navigation accuracy 2 m</li> <li>♦ False targets 2 per nmi<sup>2</sup></li> <li>♦ Greater endurance reduced MCM unmanned vehicles requirements by a factor of 4.8</li> <li>♦ Mine clearance requires hours with pre-positioned sensor field</li> </ul>                                                                                               |