



The method to our madness

Independent Cost Estimating at the PBO

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About the PBO

- Legislative mandate as per the *Parliament of Canada Act*
- Enable parliamentarians to hold the government to account
- We have no interest in the outcome of the cost estimate, only in the fiscal impact
- We believe in presenting ranges that account for program and project risks

Agenda

GAO

United States Government Accountability Office
Applied Research and Methods

Figure 1: The Cost Estimating Process

Initiation and research

Your audience, what you are estimating, and why you are estimating it are of the utmost importance

Assessment

Cost assessment steps are iterative and can be accomplished in varying order or concurrently

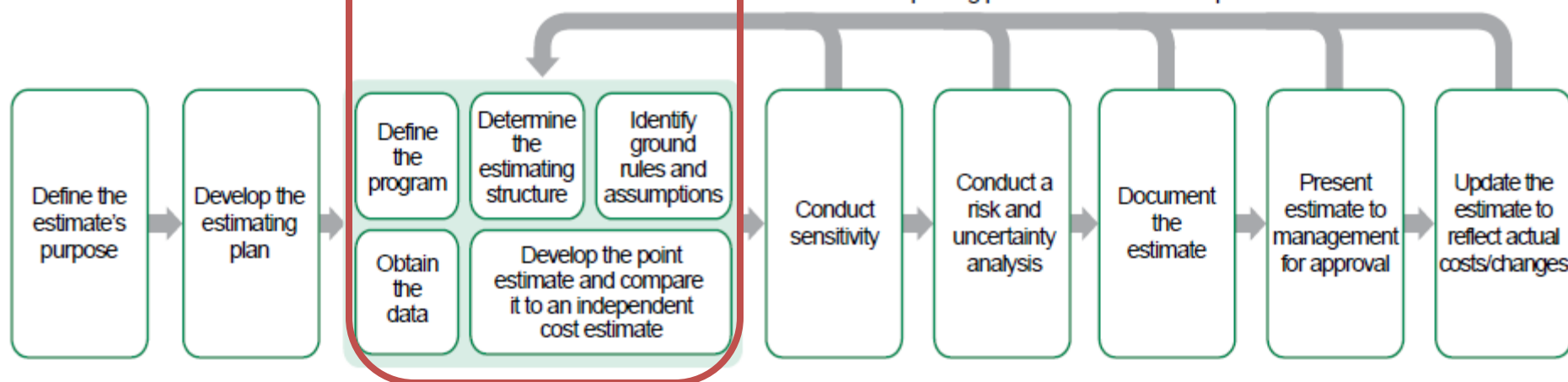
Analysis

The confidence in the point or range of the estimate is crucial to the decision maker

Presentation

Documentation and presentation make or break a cost estimating decision outcome

Analysis, presentation, and updating the estimate steps can lead to repeating previous assessment steps



Source: GAO.

Ground Rule #1:

The PBO is Policy Neutral

- When we provide an independent cost estimate (ICE) to deliver the full project scope, on time
 - We don't critique the procurement strategy
 - We don't adjust the requirements
 - We don't change the schedule

****Caveat****

The PBO is Neutral and Realistic

- Neutrality doesn't mean that we don't attribute a cost to the policy decision
 - Cost of materials
 - Cost of transportation
 - Labour rates and productivity

Example: JSS Schedule

Schedule Reality

- Project schedule not proportionate to actual schedules of similar projects
- Sensitivity analysis showed that the proposed schedule is sub-optimal

Good Practice

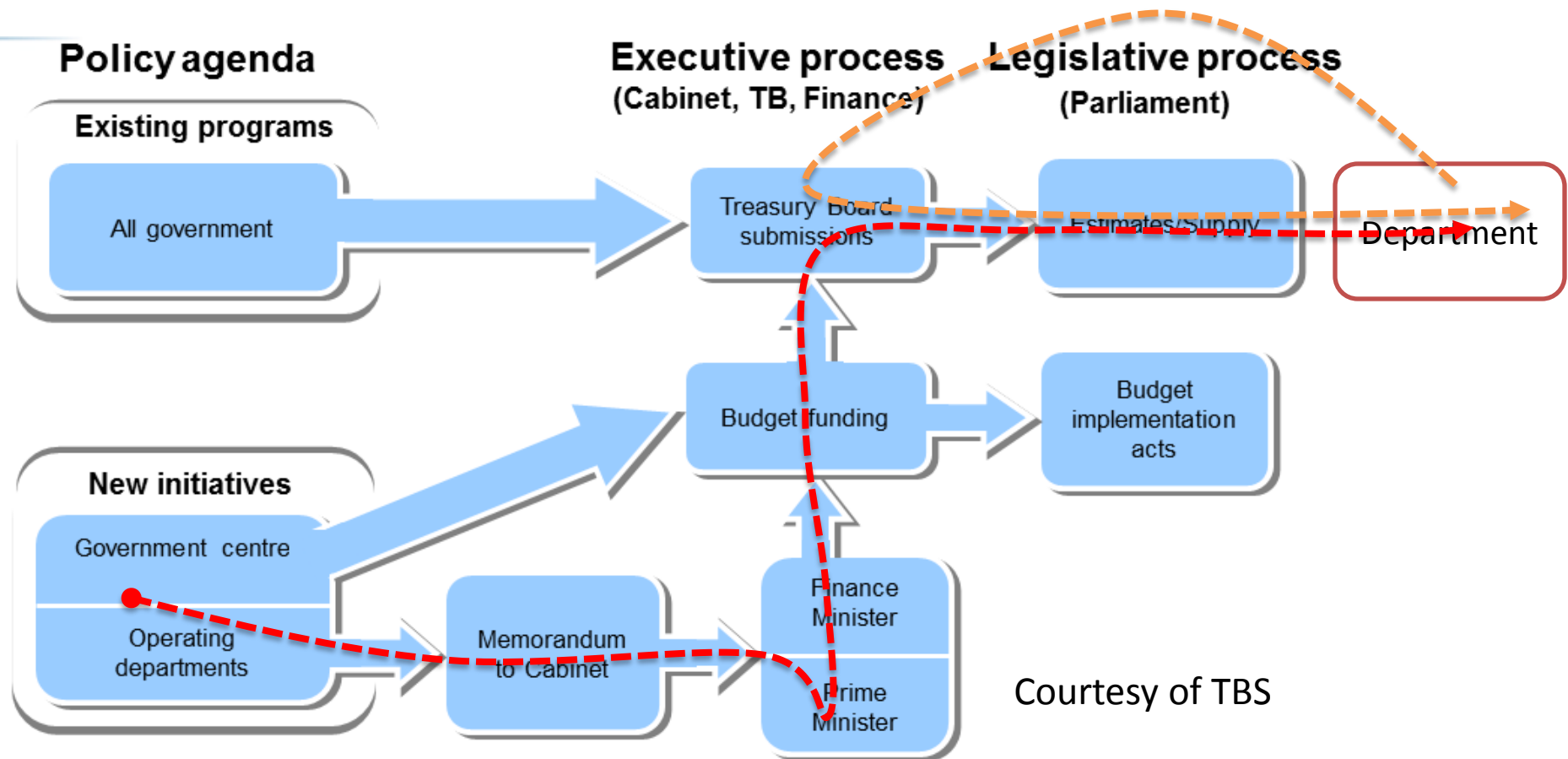
- Identify scheduling considerations (e.g. change in regulations)
- Obtain historical program data to inform analysis
- Establish schedule by balancing operational and fiscal considerations

Policy Neutrality

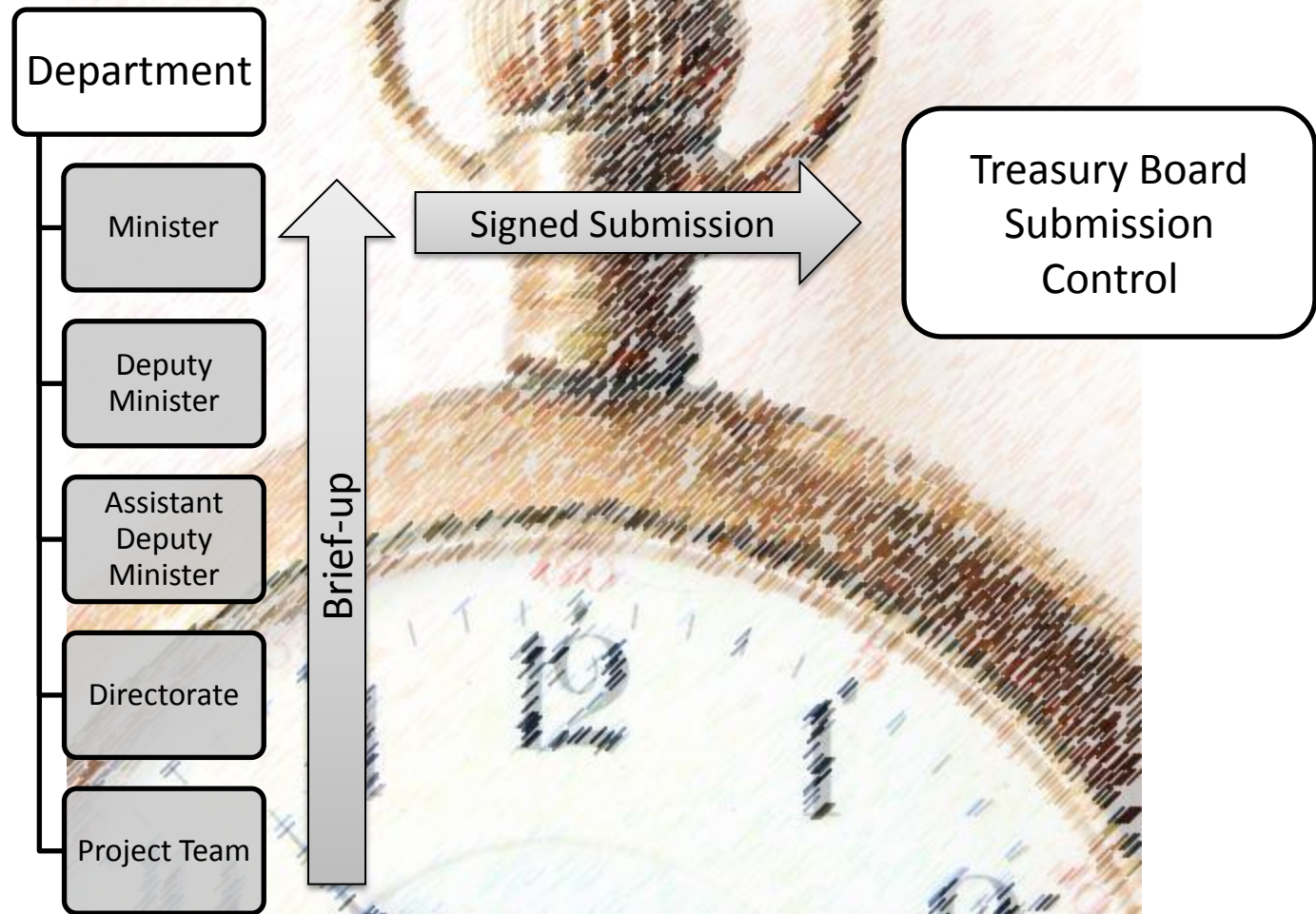
- Non-partisan role means working with the assumption that programs will role-out as planned
- *It also increased the cost estimate*



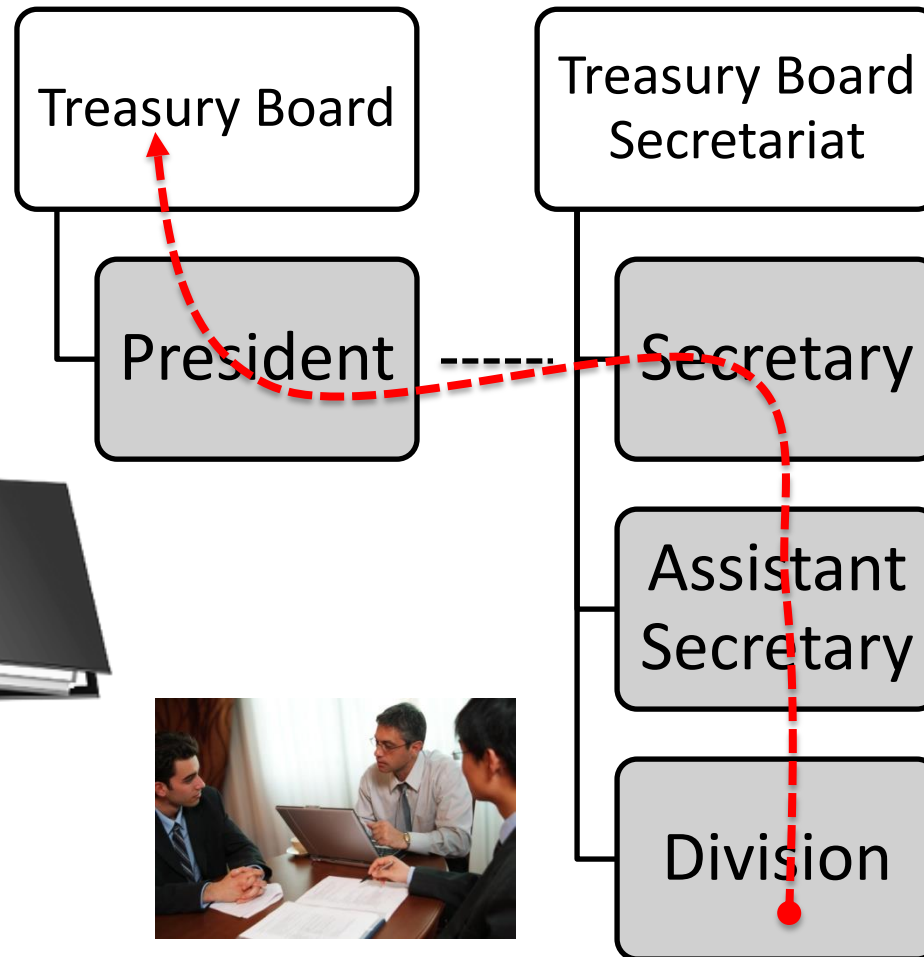
In theory, procurement is supposed to go something like this...



Department's “green light” process

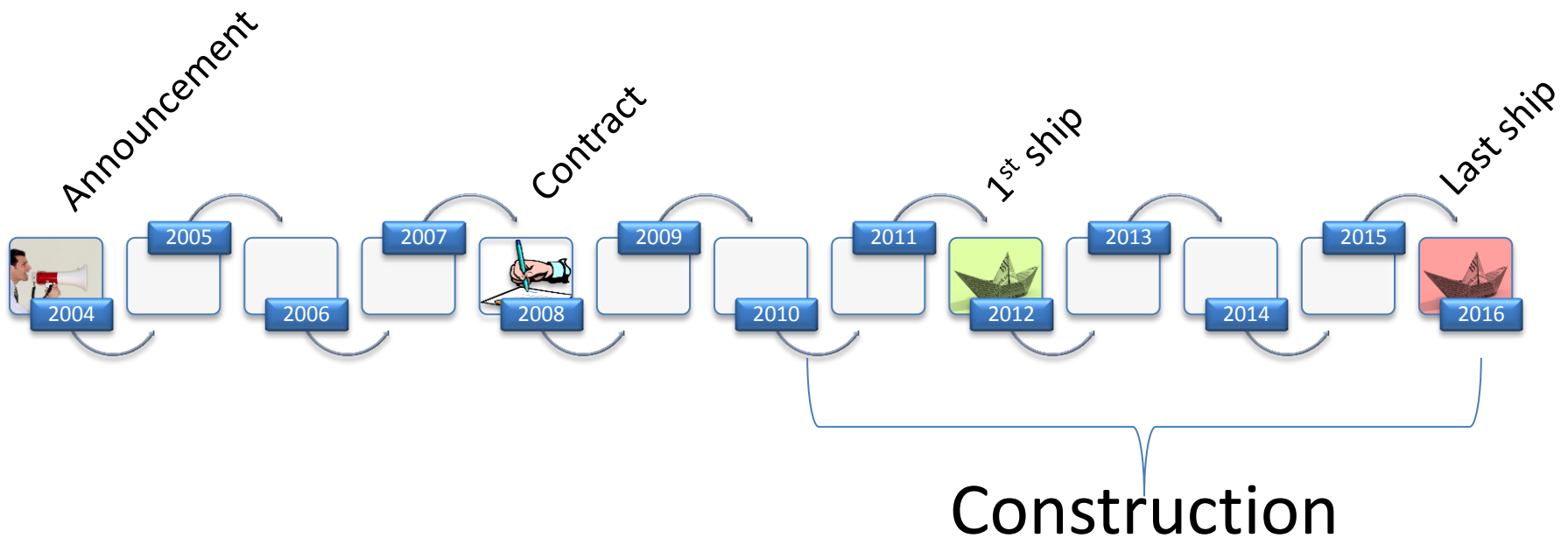


“Green Light” at TBS

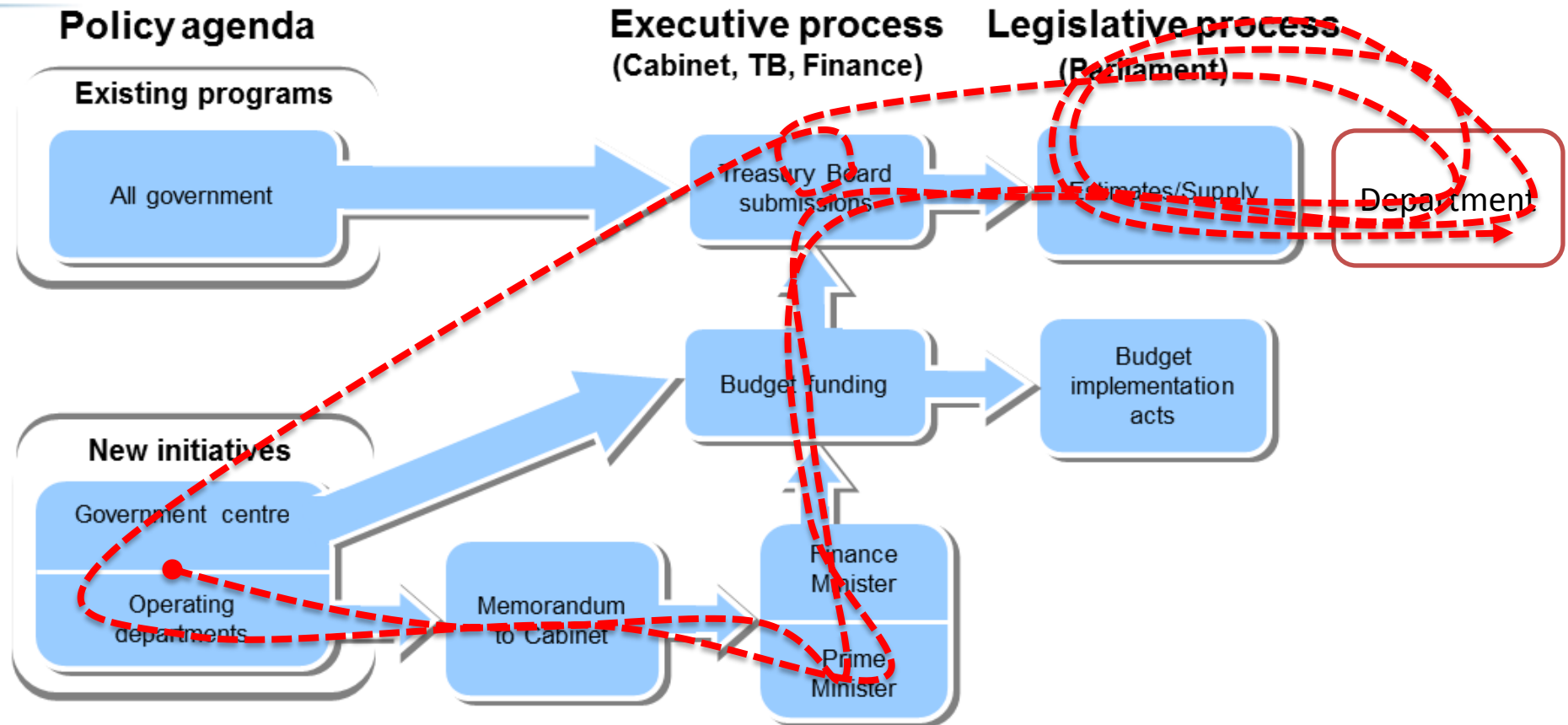


JSS 1

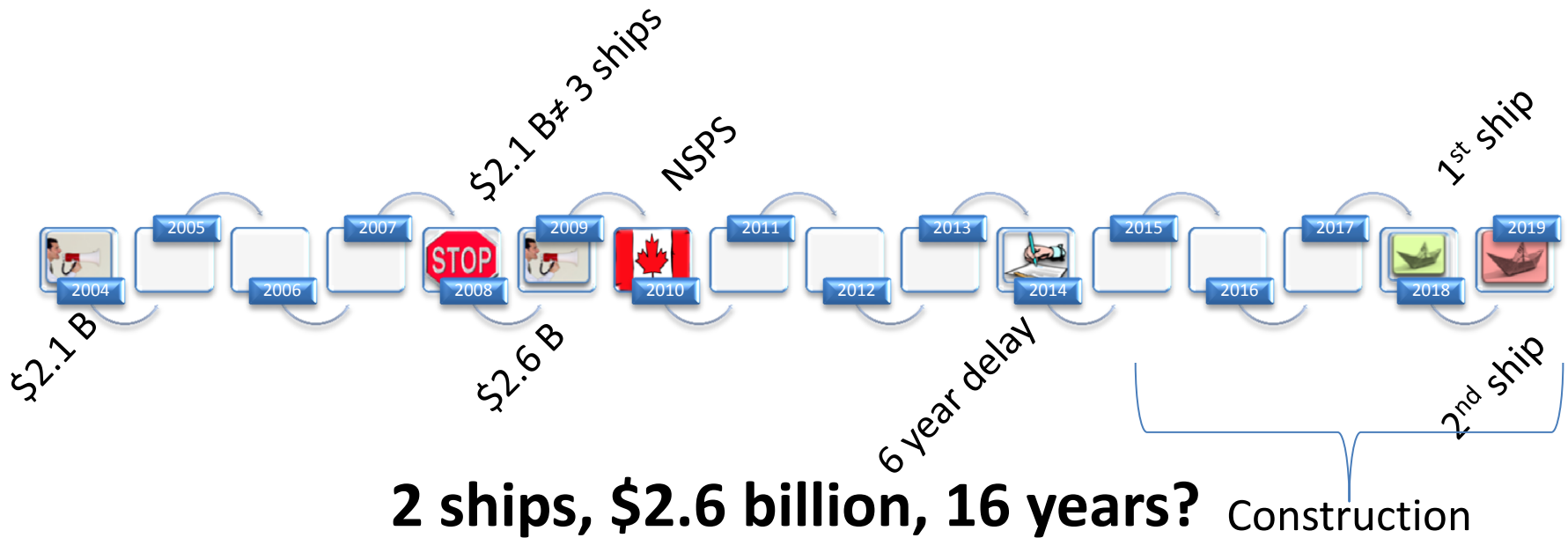
3 ships, \$2.1 billion, 13 years



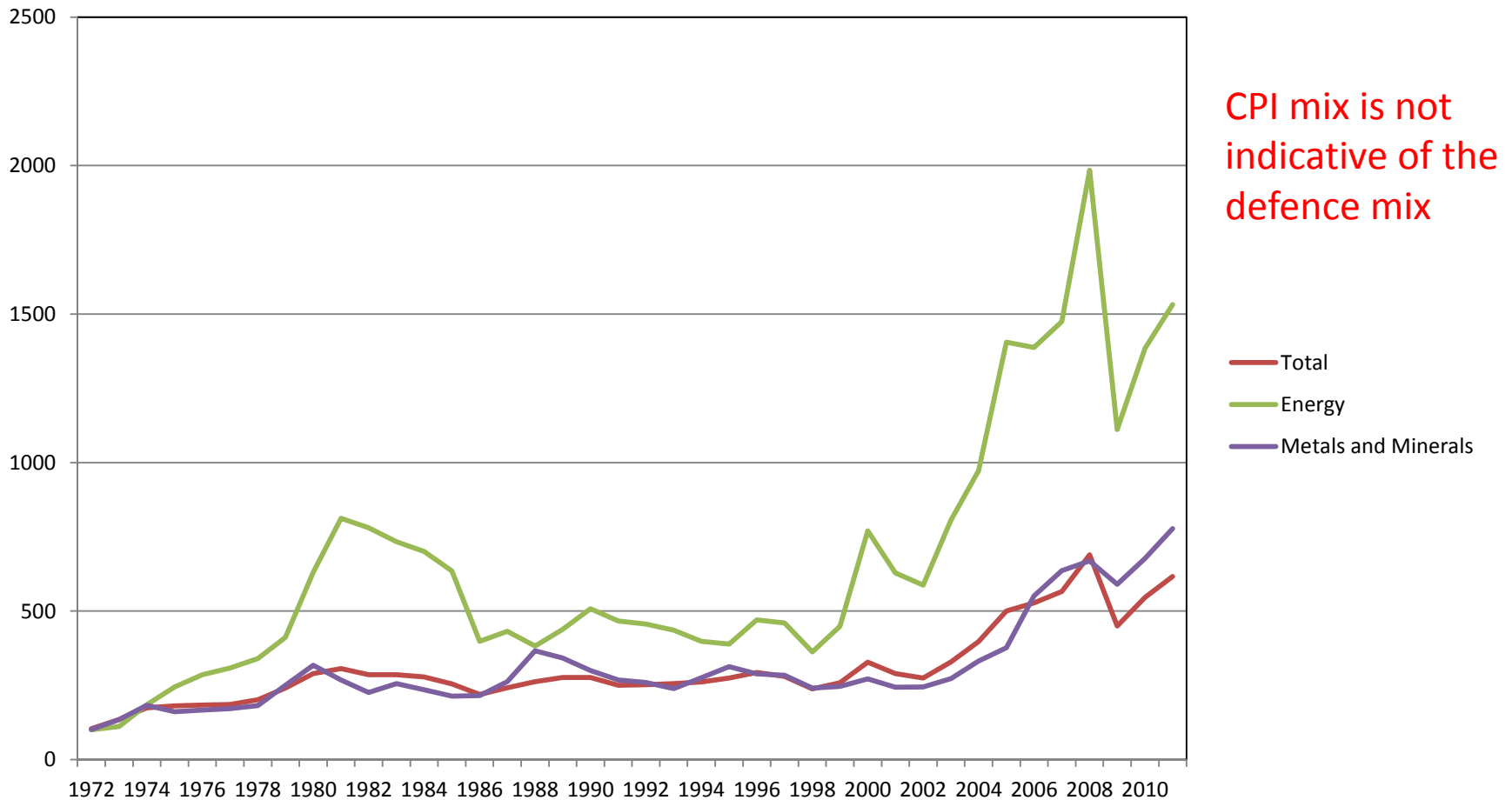
And then things don't go as planned...



JSS 2



Bank of Canada Inflation Indexes



Bank of Canada, *Consumer Price Index, 2000 to Present* (2012) online: Bank of Canada <<http://www.bankofcanada.ca/rates/price-indexes/cpi/>>

Can't we just design to cost?



$$\sqrt{-1}$$

- It exists on paper, but not in the real world

What are the impacts of a 20 year gap in shipbuilding?



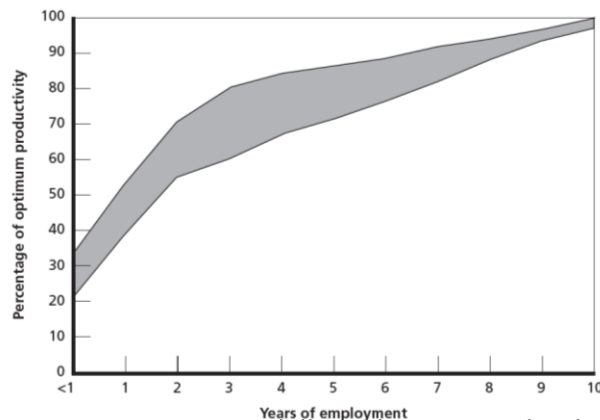
- Extensive experience building barges and ferries (60-80 meters)
- Staffing ramp-up required to support NSPS workload
- Retrofits required to undertake JSS project

Challenge: How to determine model inputs using qualitative information

When I don't have the data, I use boxed metrics

Qualitative

1. AOR's have not changed much, but the design will be unique
2. Staffing ramp-up required to support NSPS workload



RAND, Sustaining Key Skills in the UK Naval Industry (2008)

(http://www.rand.org/content/dam/rand/pubs/monographs/2008/RAND_MG725.pdf), p. 35

Engineering Complexity

Scope of Design Effort	Experience of Personnel			
	Extensive, Familiar Product	Normal, Familiar Product	Mixed, Some Product Familiarity	Limited, Unfamiliar Product
Simple Modification, Existing Design	0.2	0.3	0.4	0.5
Extensive Modification, Existing Design	0.6	0.7	0.8	0.9
New Design, Existing Technology	0.9	1	1.1	1.2
New Design, New Product Line	1	1.2	1.4	1.6
New Design, Unfamiliar Technology	1.3	1.6	1.9	2.2
New Design, State of Art Technology	1.9	2.3	2.7	3.1

3 Take-away Messages

1. Policy neutrality doesn't mean that policy is free
2. Scheduling slippage is a significant cost driver
3. A valid cost estimate should reflect who we are, not who we wish to be

THANK YOU