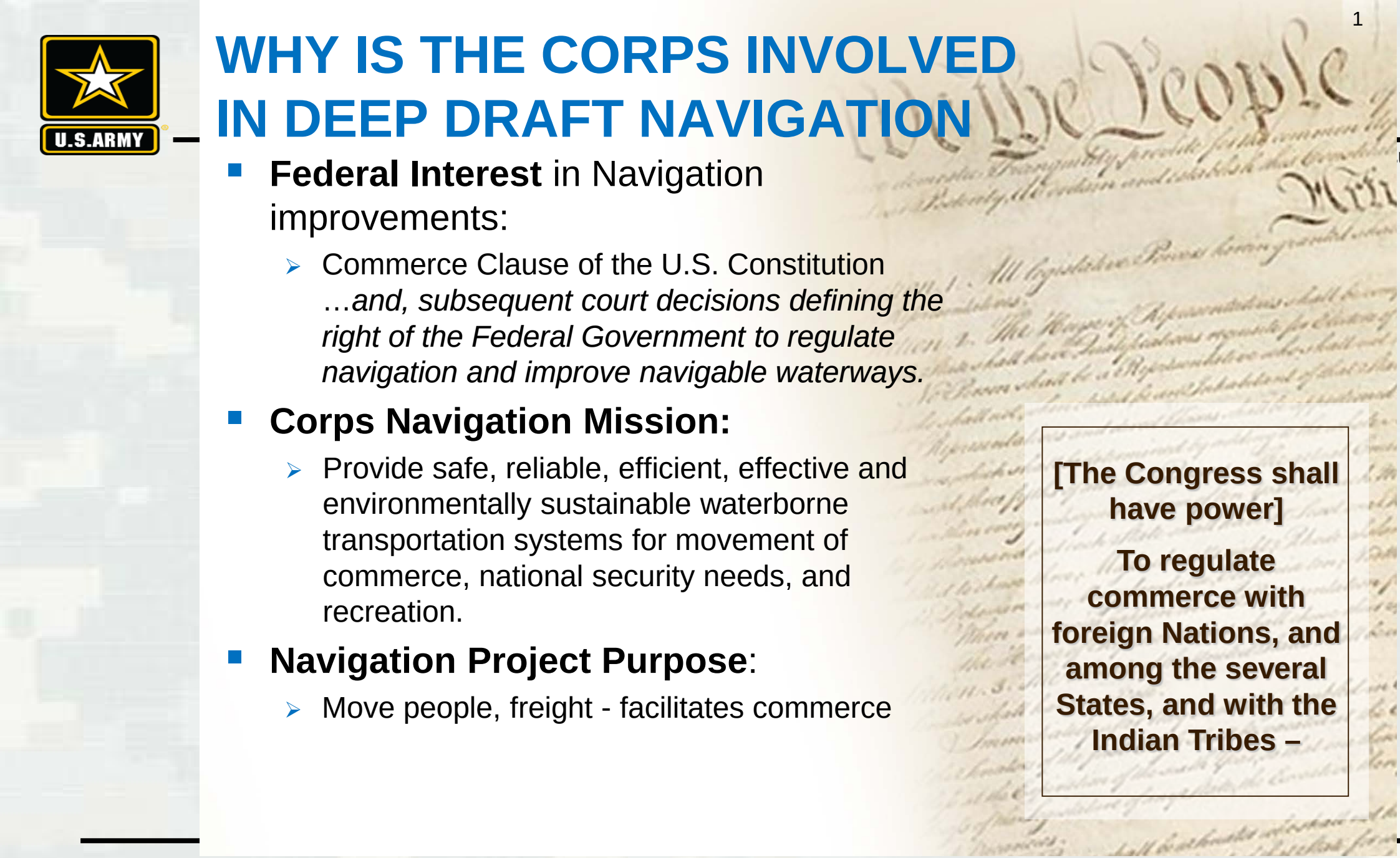
WHY IS THE CORPS INVOLVED IN DEEP DRAFT NAVIGATION

- **Federal Interest** in Navigation improvements:
  - Commerce Clause of the U.S. Constitution *…and, subsequent court decisions defining the right of the Federal Government to regulate navigation and improve navigable waterways.*
- **Corps Navigation Mission:**
  - Provide safe, reliable, efficient, effective and environmentally sustainable waterborne transportation systems for movement of commerce, national security needs, and recreation.
- **Navigation Project Purpose**:
  - Move people, freight - facilitates commerce



- ***Principal Direct Economic Benefits***

  (& Basis for Measurement)

  Elimination or Reductions in Transportation Cost(s) for……

  - *Benefits for Indigenous Markets and Related Maritime Operations*
  - *Benefits for Shift-of-Origin or Shift-of-Destination*
  - *Induced Movements*

- ***Elimination or Reductions In Transportation Costs(s)***
  - *Employment of Larger Vessels*
  - *More Efficient Use of Vessels*
  - *Lower Tug Assistance or Handlings Cost(s)*
  - *Reductions In Transit Time (Waterborne or Landside, etc.)*
  - *Use of Alternative Mode (Land vs. Water, etc.)*

Planning Process
Deep Draft Navigation

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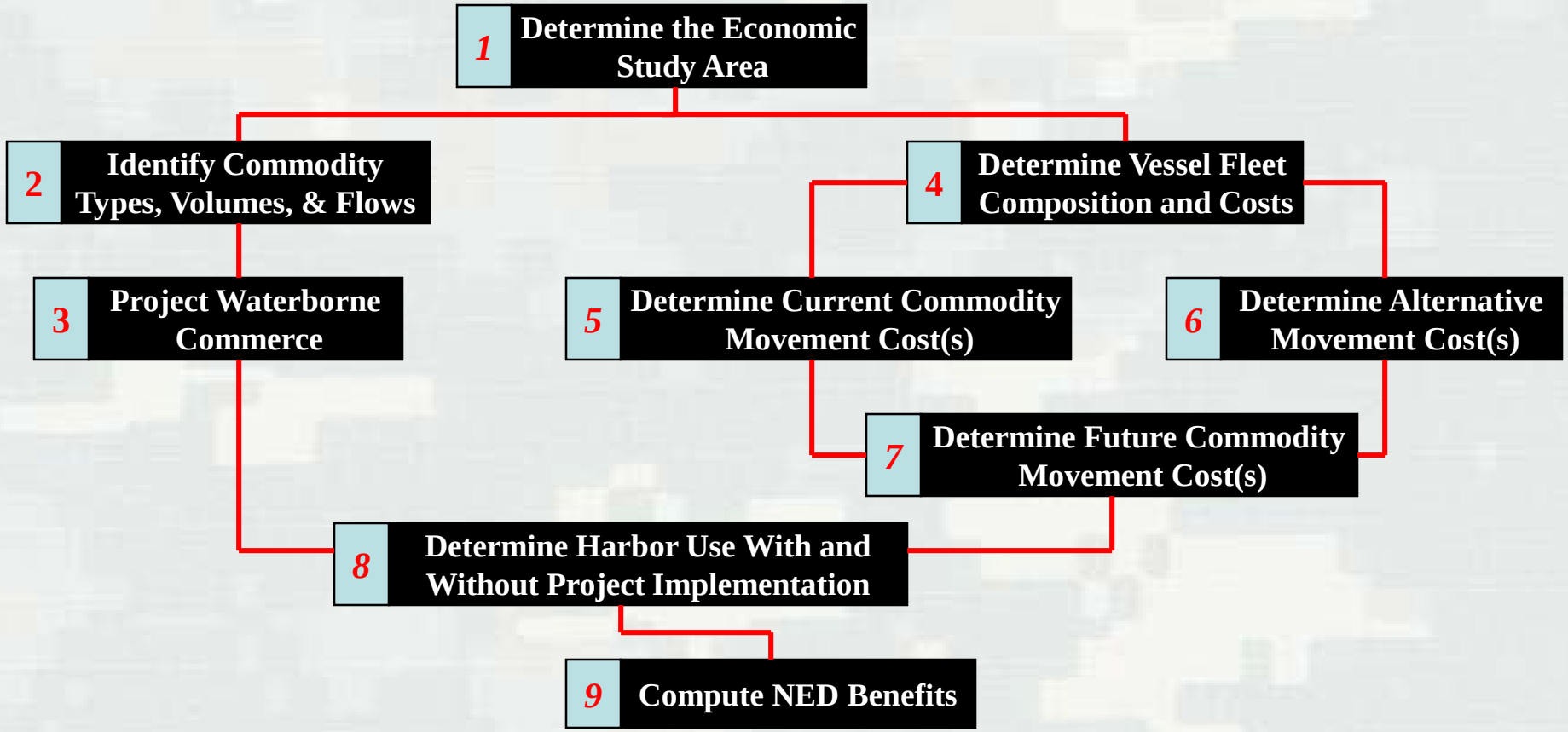
- **Step 1: Identifying Problems and Opportunities**
  - **Objectives and Constraints**
- Step 2: Inventory and Forecast
  - Existing Conditions
  - Future Without-Project Conditions
- Step 3: Formulation of Alternative Plans
  - Management Measures
    - Nonstructural and Structural
  - Alternatives
- Step 4: Evaluating Alternative Plans
- Step 5: Comparing Alternative Plans
- Step 6: Selecting a Plan

Evaluation Process Schematic

BUILDING STRONG



Step 6: Selecting a Plan

NED Benefits (Transportation Cost Savings)

- Cost Reduction Benefit (same origin-destination and same mode)
  - Reductions in costs incurred from trip delays
  - Increased loads in existing ships
  - Reduction in costs because larger or longer tows
  - Reduction in costs because of using larger ships
  - Change in port rotation
- Change in mode benefits
- Shift of origin-destination benefits
- Induced movement benefit (if you build it, will they come?)
- Reduction in vessel damages
- Impacts to other harbor users

Corps Certified Benefit Computation Model: HarborSym

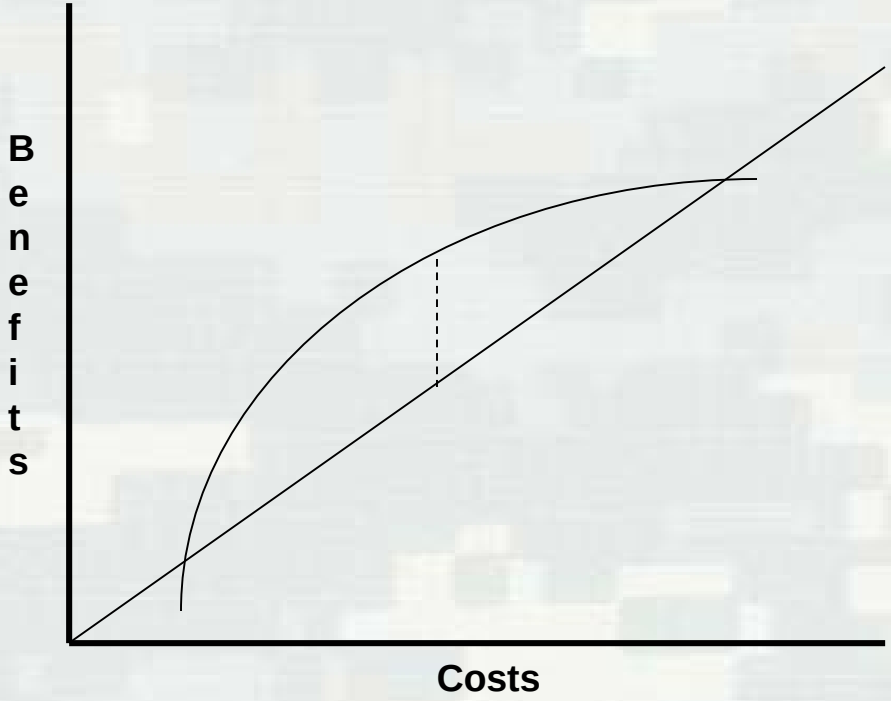
Concepts of Federal Benefit-Cost Analysis

- National Economic Development (NED) Benefits
  - Conceptual basis for benefits
  - NED vs. Regional Economic Development
- National Economic Development Costs
  - Associated costs
  - Interest during construction

Benefit-Cost Analysis Concepts
(Continued)

- "With-" and "Without-project" Conditions
- Average Annual Benefits and Costs
  - Interest rate
  - Price level
  - Period of analysis
- Incremental Analysis

Net Benefits



Plan Selection

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Alternative Project Depths (in Feet)	Avg. Annual Equivalent Cost	Avg. Annual Equivalent Total Benefit	Avg. Annual Equivalent *Net* Benefit
45.0 ft.	$13,000,000	$15,210,000	$2,210,000
46.0 ft.	$13,650,000	$16,107,000	$2,457,000
47.0 ft.	$14,469,000	$17,797,000	$3,328,000
48.0 ft.	$15,482,000	$18,888,000	$3,406,000
49.0 ft.	$24,152,000	$27,775,000	$3,623,000
50.0 ft.	$37,919,000	$39,057,000	$1,138,000

Efficiency

Total surplus = (value to buyers) – (cost to sellers)

An allocation of resources is efficient if it maximizes total surplus. Efficiency means:

- The goods are consumed by the buyers who value them most highly
- The goods are produced by the producers with the lowest costs
- Raising or lowering the quantity of a good would not increase total surplus
- The NED Plan is efficient!

Market Equilibrium

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Market eq'm:

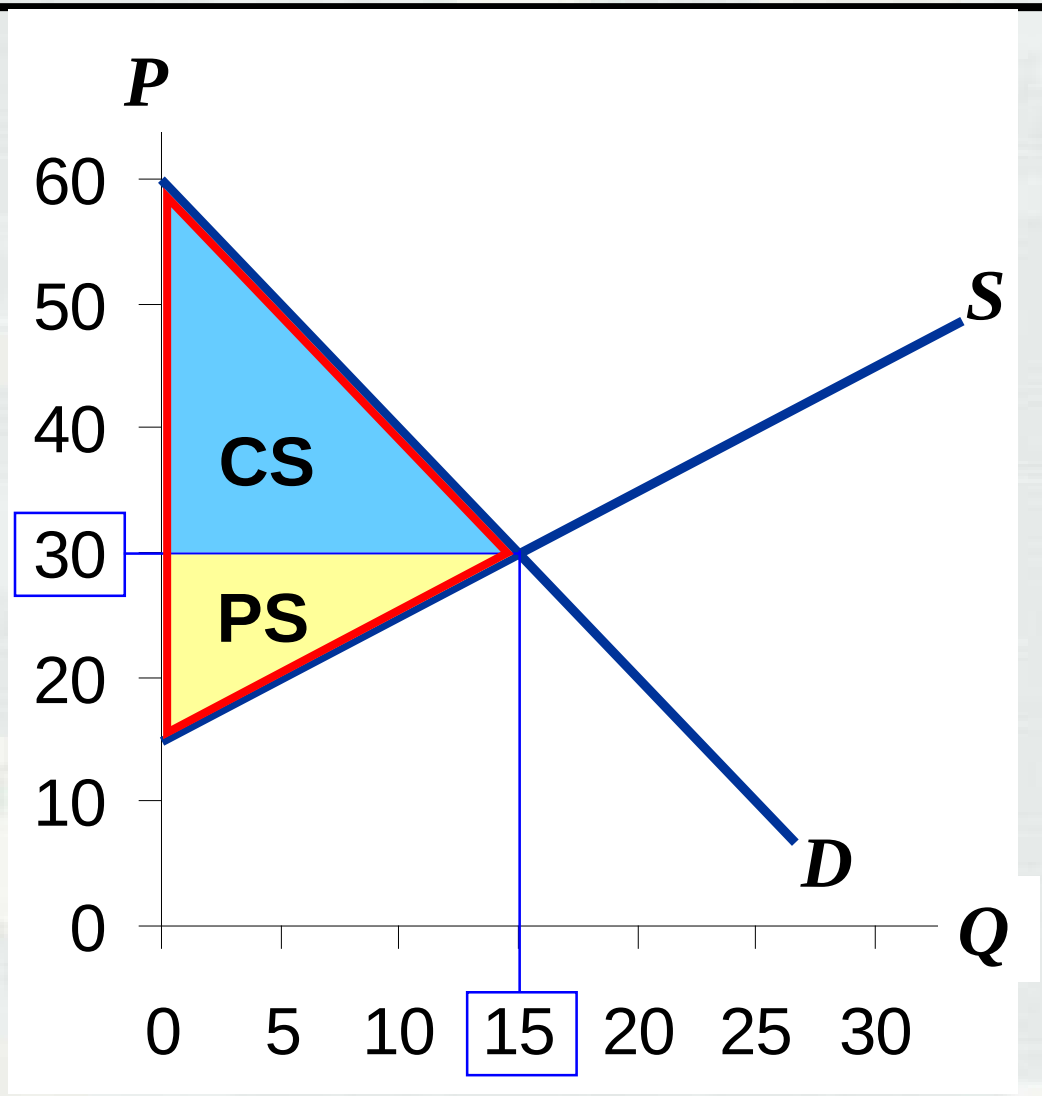
P = $30

Q = 15,000

Total surplus

= CS + PS

Is the market eq'm efficient?



Navigation Benefits

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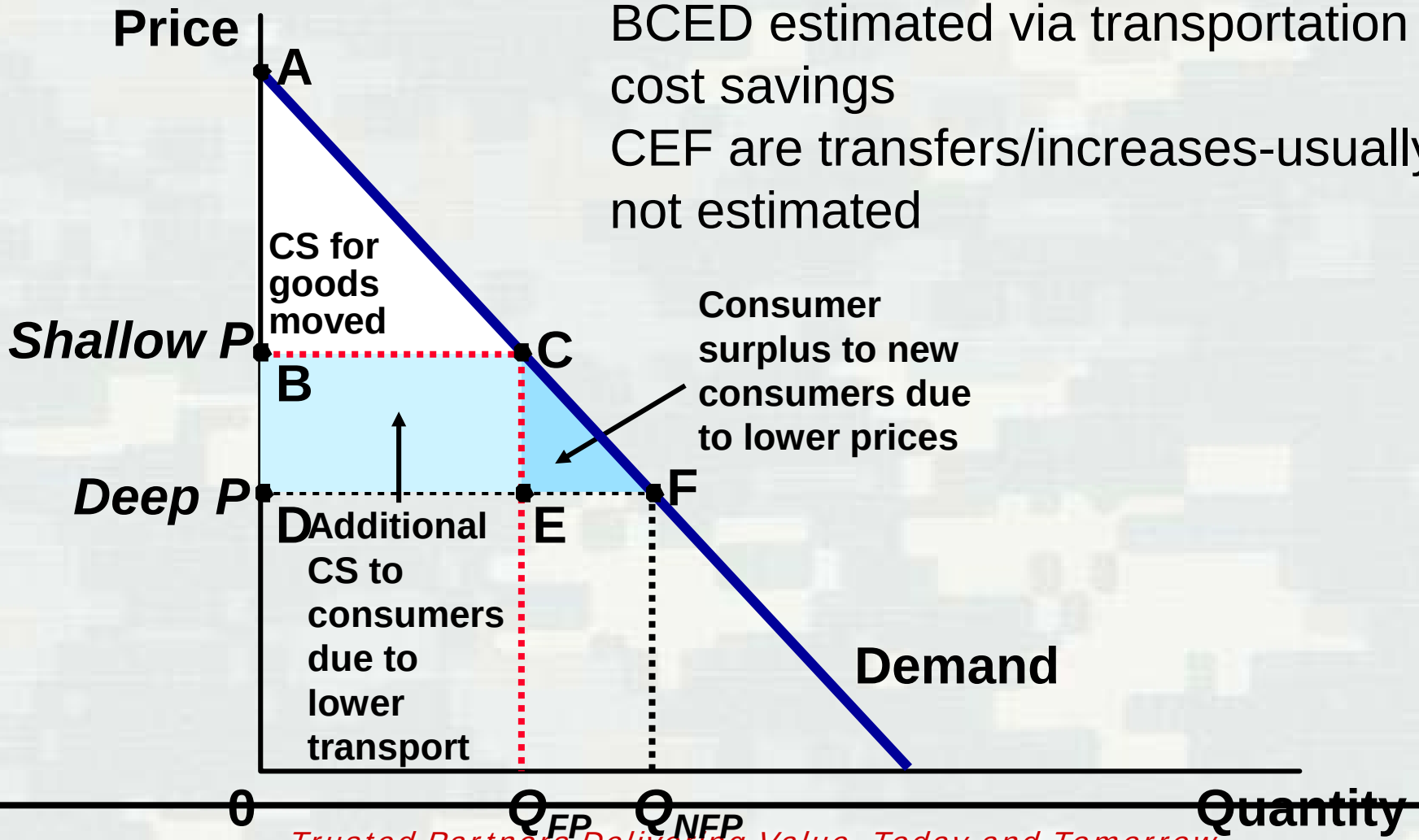

BCED estimated via transportation cost savings

CEF are transfers/increases-usually not estimated

A Closer Look at Navigation

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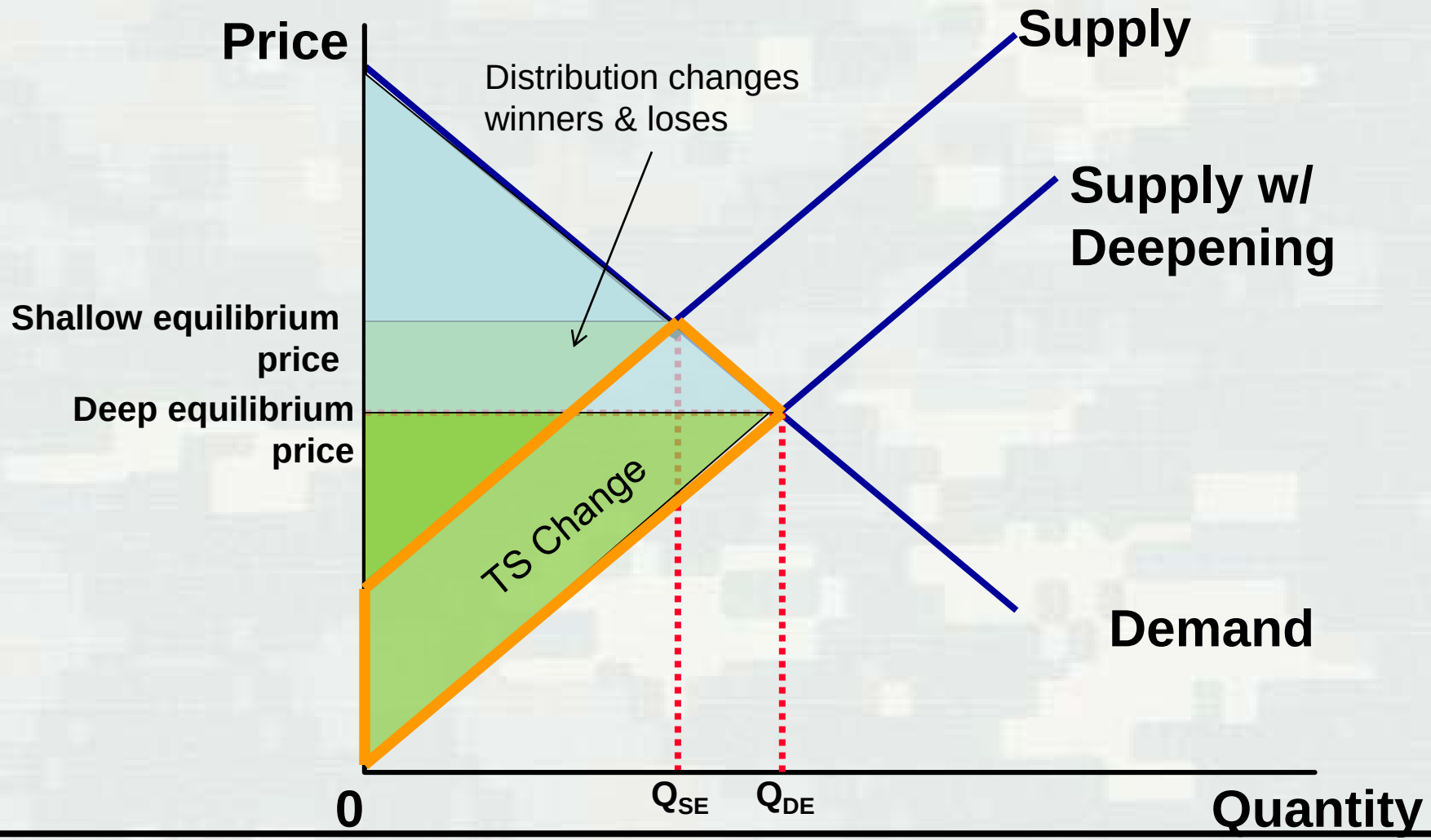

Estimating Benefits

- These concepts guide our thinking
  - Changes, transfers and additions
- We rarely have demand or supply curves
- Use your basic economic models to think about situations
- We devise clever ways to approximate these areas

Example Cost Efficiencies

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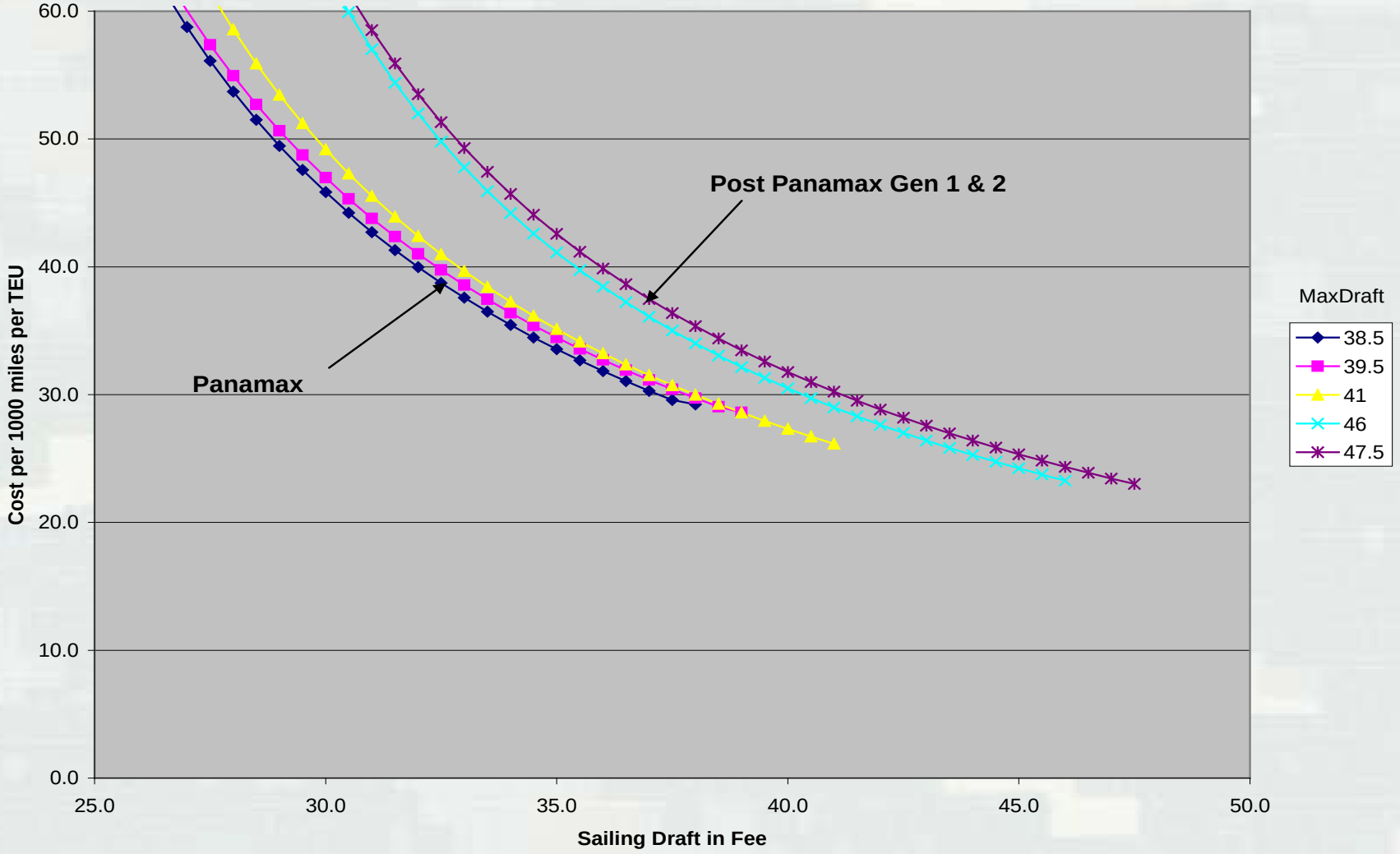

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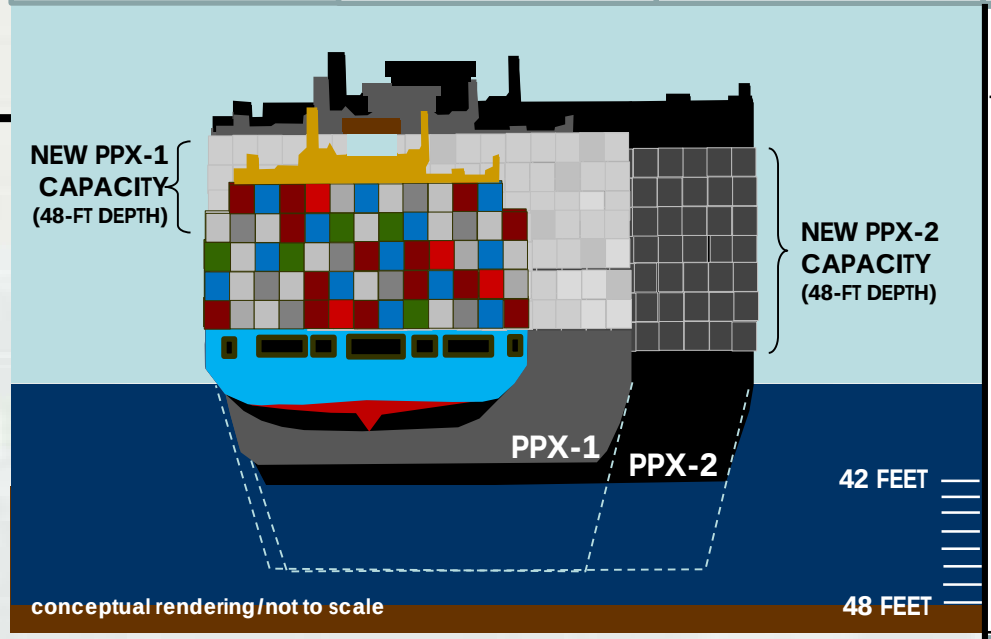
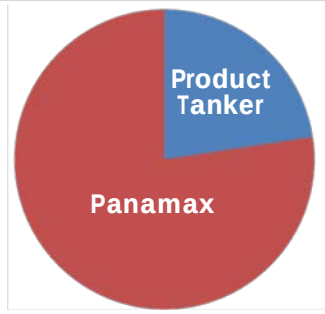


CONTAINERS

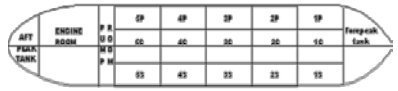
ADDITIONAL TEU CAPACITY: 37% PROJECT BENEFITS

Example: Port Everglades

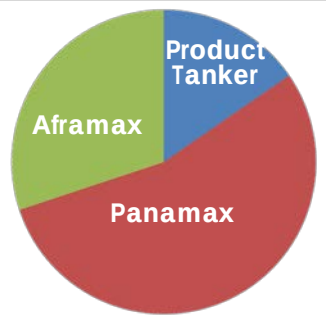


WITHOUT PROJECT

FOREIGN-FLAGGED FLEET

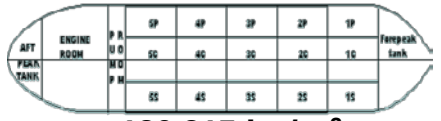


52,100 – 79,200 kg/m³



WITH PROJECT (48-FT)

FOREIGN-FLAGGED FLEET

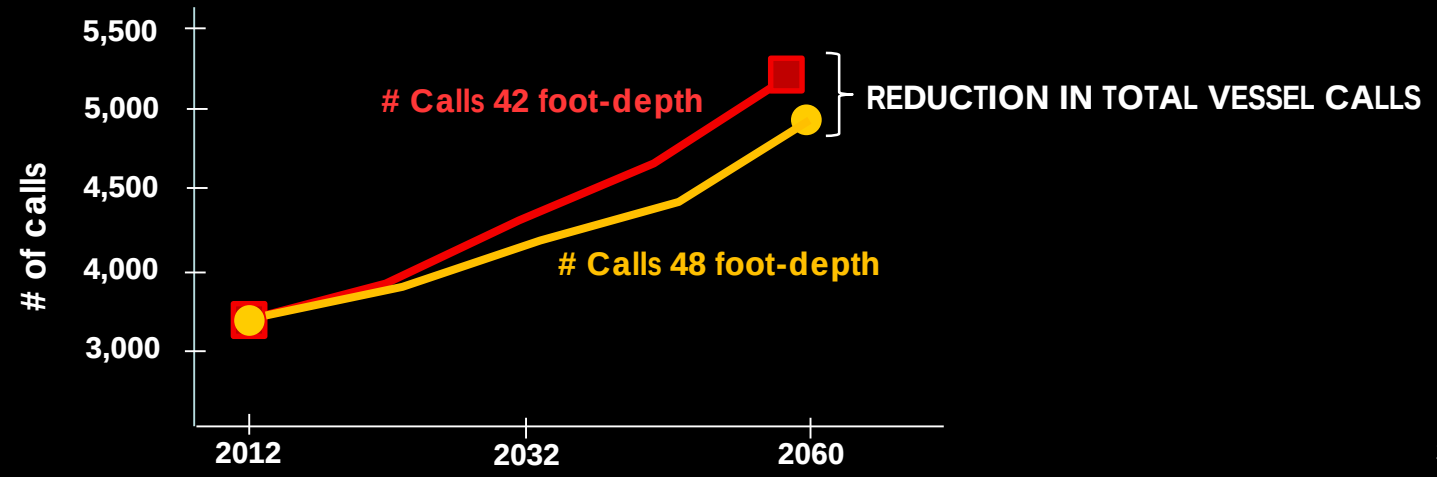


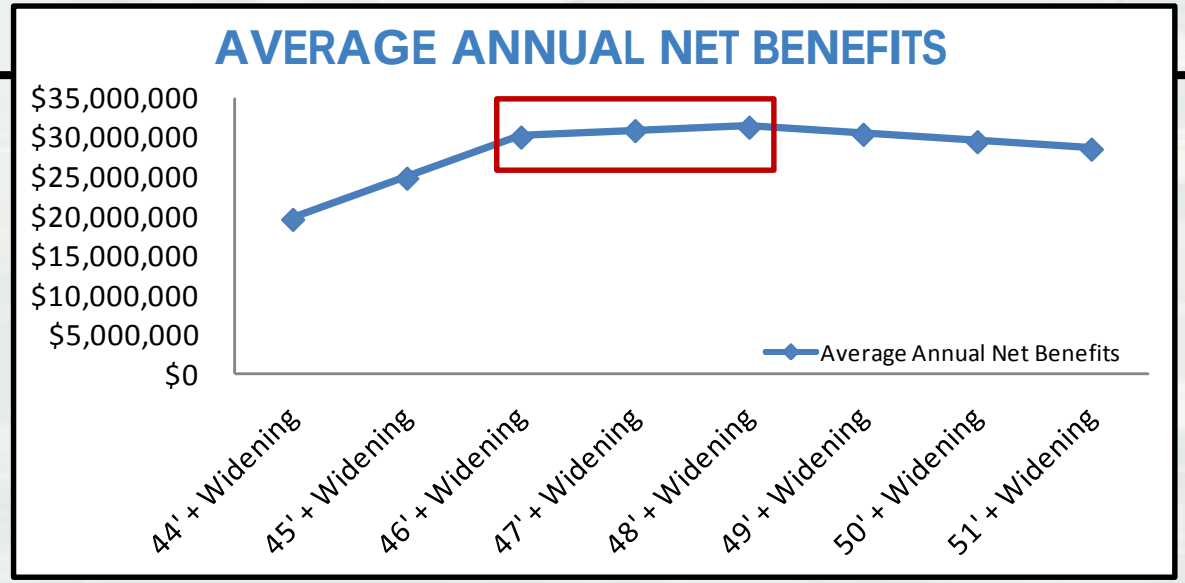
120,315 kg/m³

TANKERS

ADDITIONAL LIQUID CAPACITY: 58% PROJECT BENEFITS

ECONOMICS





DEPTH	AVERAGE ANNUAL COSTS*	AVERAGE ANNUAL BENEFITS	AVERAGE ANNUAL NET BENEFITS	BCR
46 feet	$15,000,000	$45,100,000	$30,100,000	3.0
NED Plan: 47 feet	**$15,900,000**	**$46,900,000**	**$31,000,000**	**2.9**
LPP & Recommended Plan: 48 feet	**$16,860,000**	**$48,240,000**	**$31,400,000**	**2.9**
49 feet	$17,800,000	$48,300,000	$30,500,000	2.7

***Costs include IDC and O&M**

Example: Port Everglades

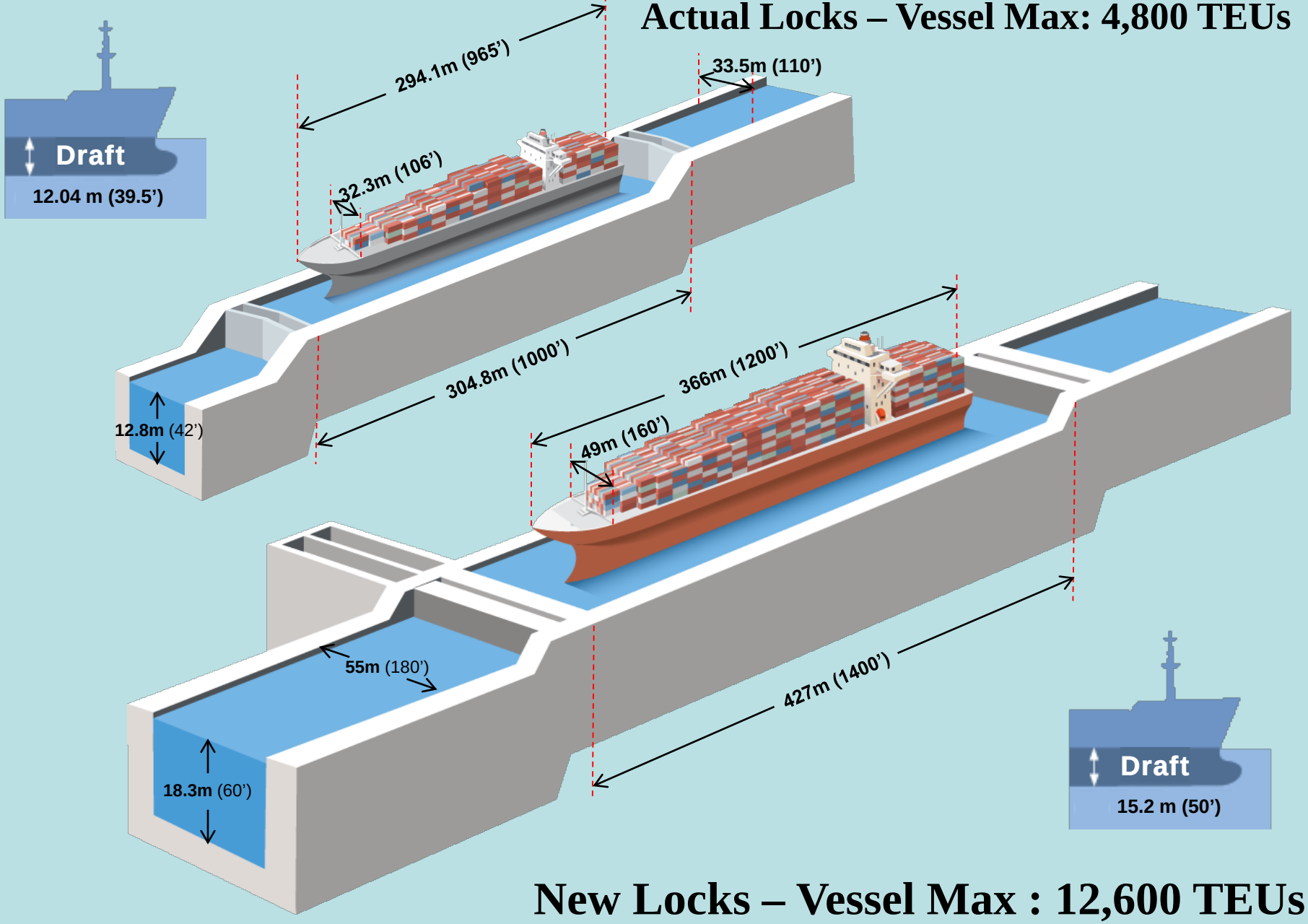
FY15 Discount Rate 3.375% & October 2014 Price Level

NED: National Economic Development
LPP: Locally Preferred Plan

The plan that reasonably maximizes net average annual equivalent (AAEQ) NED Benefits is the NED Plan.

New Locks Dimensions

Actual Locks – Vessel Max: 4,800 TEUs



New Locks – Vessel Max : 12,600 TEUs

ULCC - Jahre Viking - 565,000 DWT)

Length 1,504 ft; Beam 226 ft; Draft 81 ft

PEX3- Pacific Express 3

CMA CGM

Click to Return to the World Map *Press <ESC> to Exit Program*

	Days to Next Port	To Savannah From	From Savannah To
Savannah	1		0
Charleston	2		1
Norfolk	7		3
Tangier	10		10
Jebel Ali	5		20
Shanghai	1	30	25
Xiamen	1	29	26
Chiwan	1	28	27
Hong Kong	22	27	28

	Days to Next Port	To Savannah From	From Savannah To
Houston	3	5	
Miami	1	2	
Jacksonville	1	1	
Savannah	0	0	

Sources: Carrier's Website, PC Miller U.S. Rail desktop

Turnaround Days	56
Frequency	Weekly
Number of Vessels	8
Avg TEU Capacity per Vessel	5,100

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Georgia Ports Authority

Port of Beaumont

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Sabine Neches Waterway

Galveston Channel

Houston Ship Channel

U.S.ARMY

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Freeport Harbor

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Corpus Christi Ship Channel