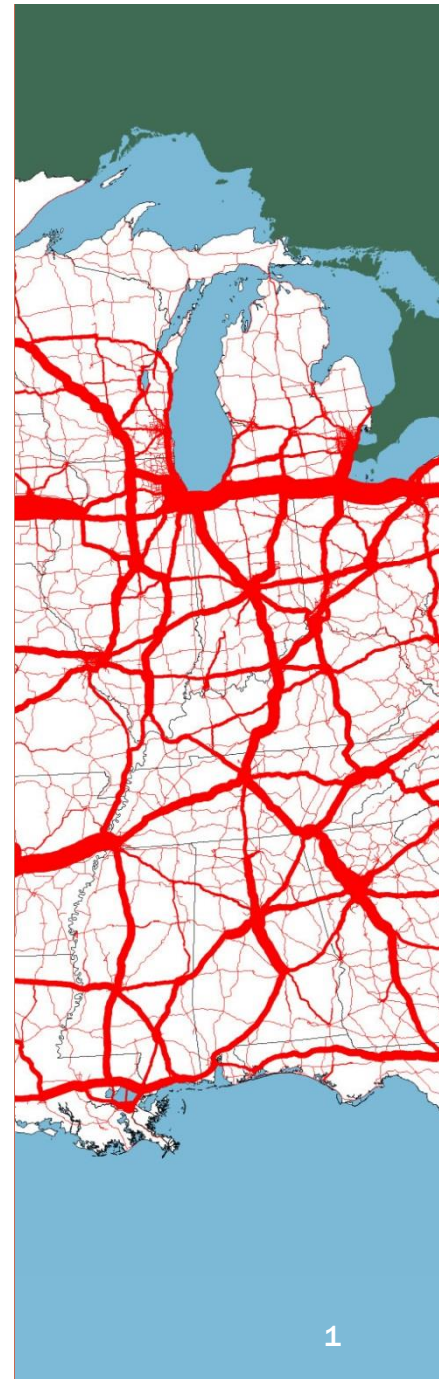


# Panama Canal Expansion: Shipper Mode & Route Choice

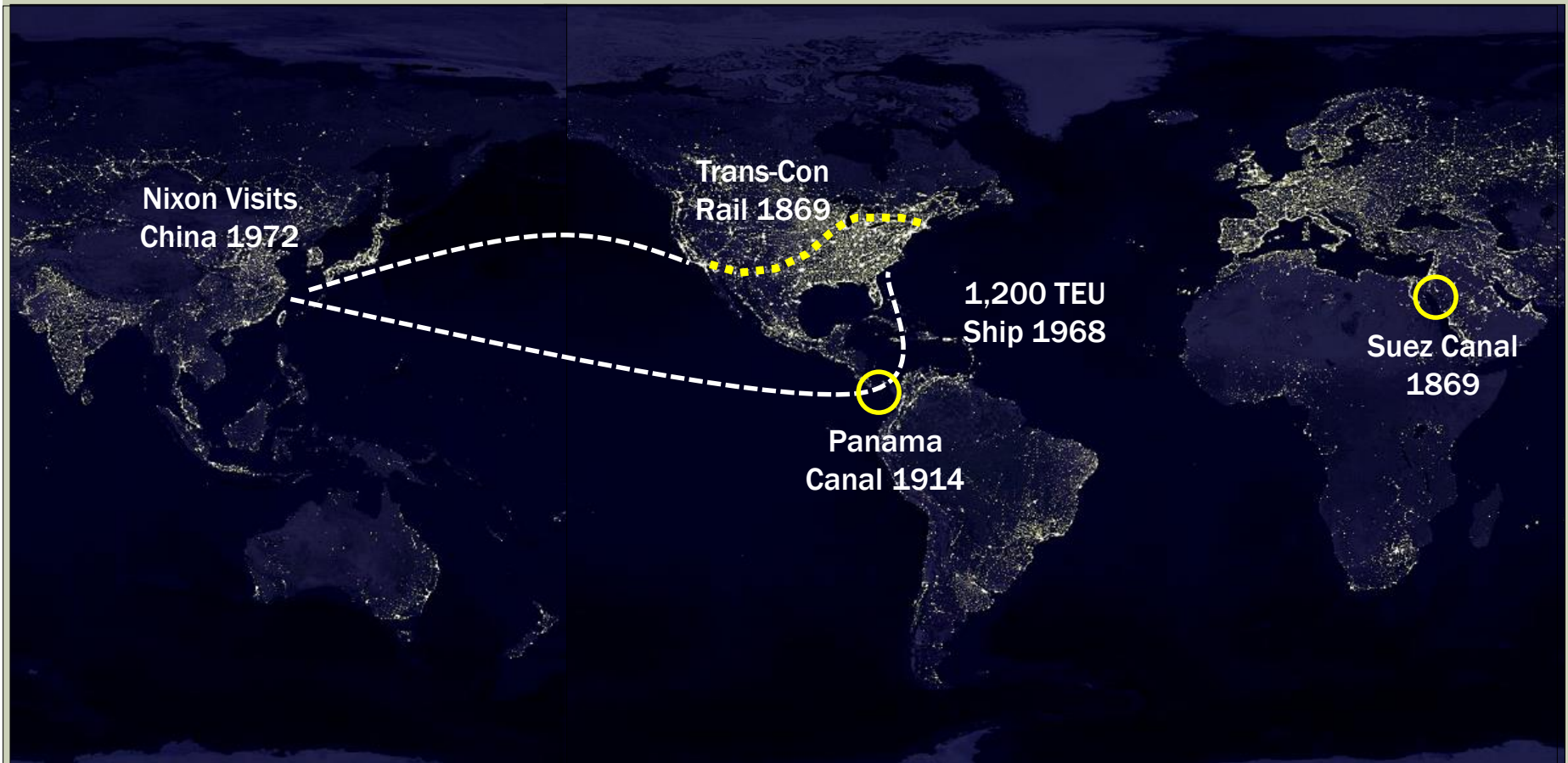
National Association for Business Economics

Dale B. Lewis  
20 August 2013

[www.dblewis.net](http://www.dblewis.net)



# THE CANAL PROJECT REMINDS US THAT TRADE ROUTES AND TECHNOLOGIES CHANGE OVER TIME



China is now our largest trading partner. Container ships are now over 10,000 TEU  
The Panama Canal is doubling its annual capacity.

# PRODUCERS, CARRIERS AND PORT AUTHORITIES WILL BE AFFECTED BY THE CANAL EXPANSION

- Changes possible for the worldwide oceangoing fleet
  - LNG carriers and larger bulk ships can be accommodated
- Potential economic changes
  - Lower costs for Far Eastern container carriers
  - Port impact of doubling ship size on ship frequency and loading
  - Increased investment for East Coast ports
  - Increased competition for West Coast ports
  - Changing logistics networks and costs for shippers
- Major questions for an ocean container carrier:
  - Do I redeploy part of my fleet to the all-water route?
  - Do I keep the savings, or share them with my shippers?

# TWO THIRDS OF PANAMA CANAL CARGO TOUCHES THE U.S. CONTAINER SHIPS ARE 24% OF THE FLOW

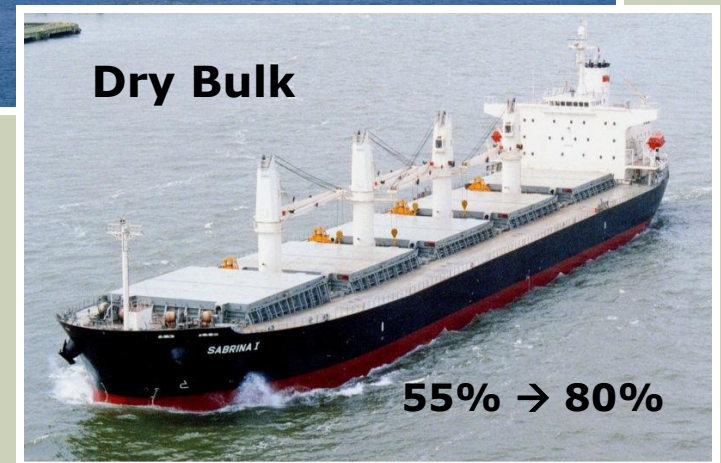
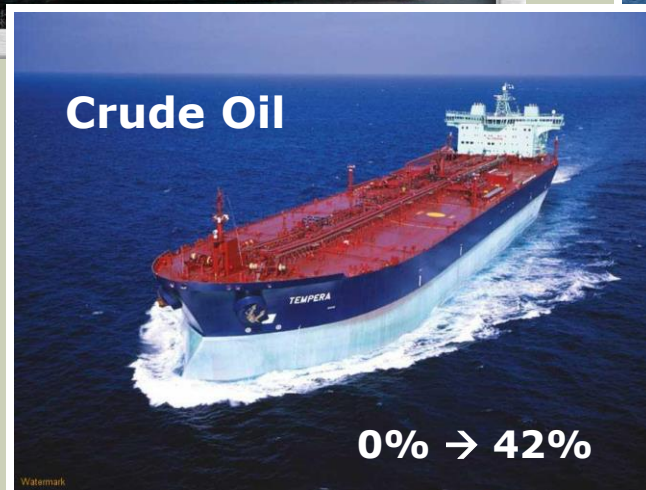
40M Tons of  
U.S. Export  
Grain



Ship Type	2010 Ship Transits			Change vs 2009
	Annual	Share	Daily	
Dry Bulk	3,050	24%	8.4	14%
<b>Container</b>	<b>3,031</b>	<b>24%</b>	<b>8.3</b>	<b>-10%</b>
Tankers	2,233	18%	6.1	-4%
Refrigerated	1,718	14%	4.7	-13%
Others	893	7%	2.4	-5%
Gen Cargo	834	7%	2.3	-4%
Auto Carriers	607	5%	1.7	29%
Passengers	225	2%	0.6	-5%
Total	12,591	100%	34.5	-2%

- Bulk ships (mostly grain) and Tank ships (no crude oil) carry specific commodities in unscheduled service.
- Consumer goods move around the world on scheduled routes in 20 to 40 foot containers.
- Dry Bulk and Container ships push the upper size limits for a significant share of their traffic, unlike other vessels.

# EXPANDED LOCKS WILL ENABLE LARGER VESSELS OF SEVERAL TYPES TO SAFELY TRANSIT THE CANAL

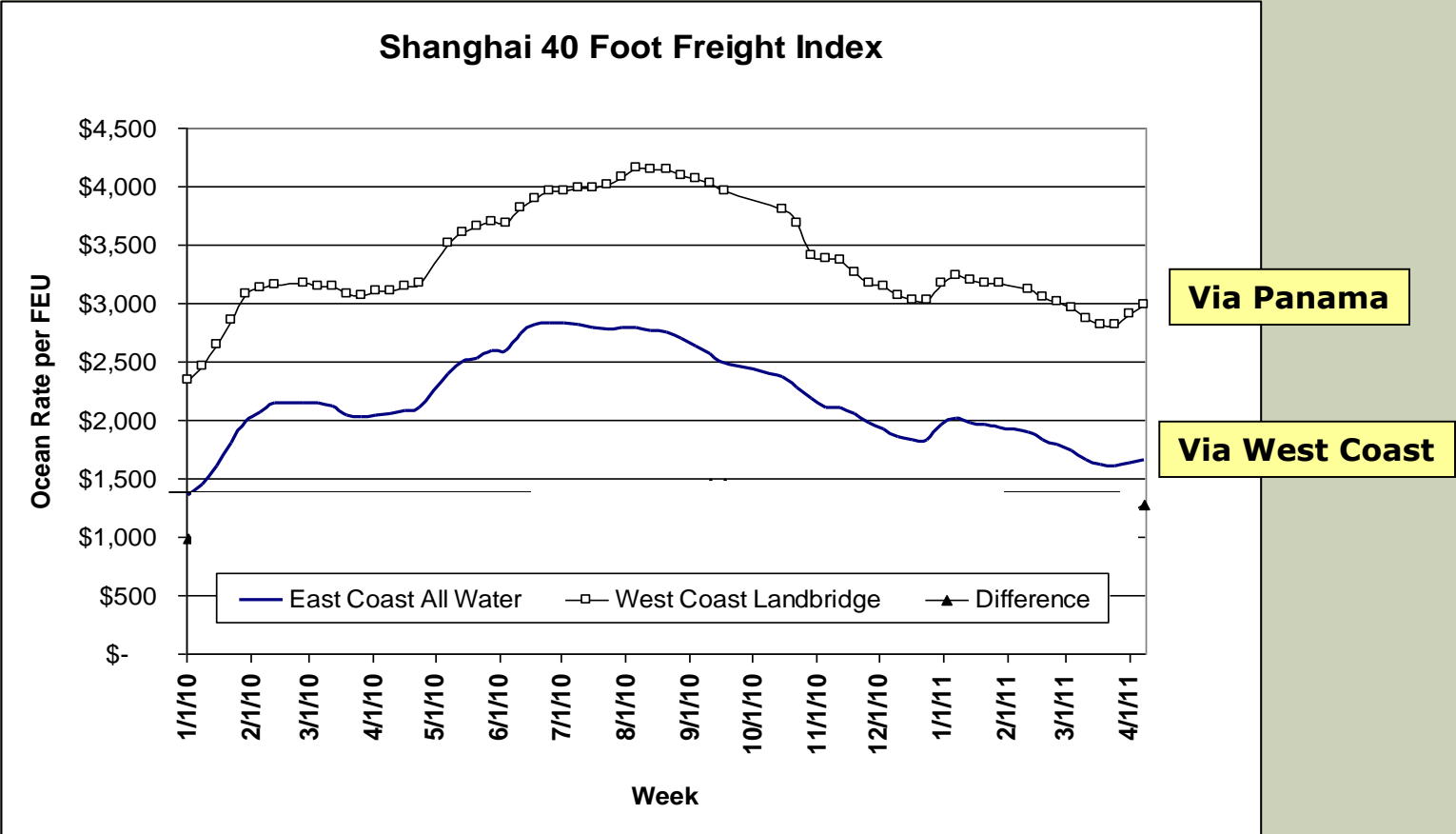


# EAST COAST PORTS ALREADY HANDLE POST-PANAMAX SHIPS, BUT FEW SHIPS ABOVE 8,000 TEU

Containership Calls by Vessel Capacity in TEU for Selected Ports  
December, 2008 through November, 2010 Totalling 24 months

PORT	LT 4400	ALL CALLS	4400 to 6000	6000 to 8000	GT 8000	GT 4400	GT 6000
New York	2642	4,690	1,942	71	35	44%	2%
Norfolk	750	1,748	915	49	34	57%	5%
Savannah	1729	3,535	1,653	149	4	51%	4%
Charleston	1723	2,605	741	109	32	34%	5%
Portsmouth	1292	1,714	360	43	19	25%	4%
Jacksonville	617	867	245	5	-	29%	1%
Miami	1279	1,755	475	-	1	27%	0%
Port Everglades	1551	1,717	124	42	-	10%	2%
Houston	1584	1,909	276	49	-	17%	3%
Mobile	300	340	40	-	-	12%	0%
Long Beach	1189	2,212	519	254	250	46%	23%
Los Angeles	1028	2,820	997	554	241	64%	28%
CAN - Halifax	110	709	597	2	-	84%	0%
CAN - Montreal	444	491	47	-	-	10%	0%
CAN - Prince Rupert	6	199	143	41	9	97%	25%
CAN - Vancouver	329	1,103	494	202	78	70%	25%
<b>Grand Total</b>	<b>16573</b>	<b>28,414</b>	<b>9,568</b>	<b>1,570</b>	<b>703</b>	<b>42%</b>	<b>8%</b>

# OCEAN FREIGHT RATES FROM SHANGHAI ARE HIGHER FOR EAST-COAST ALL-WATER MOVES

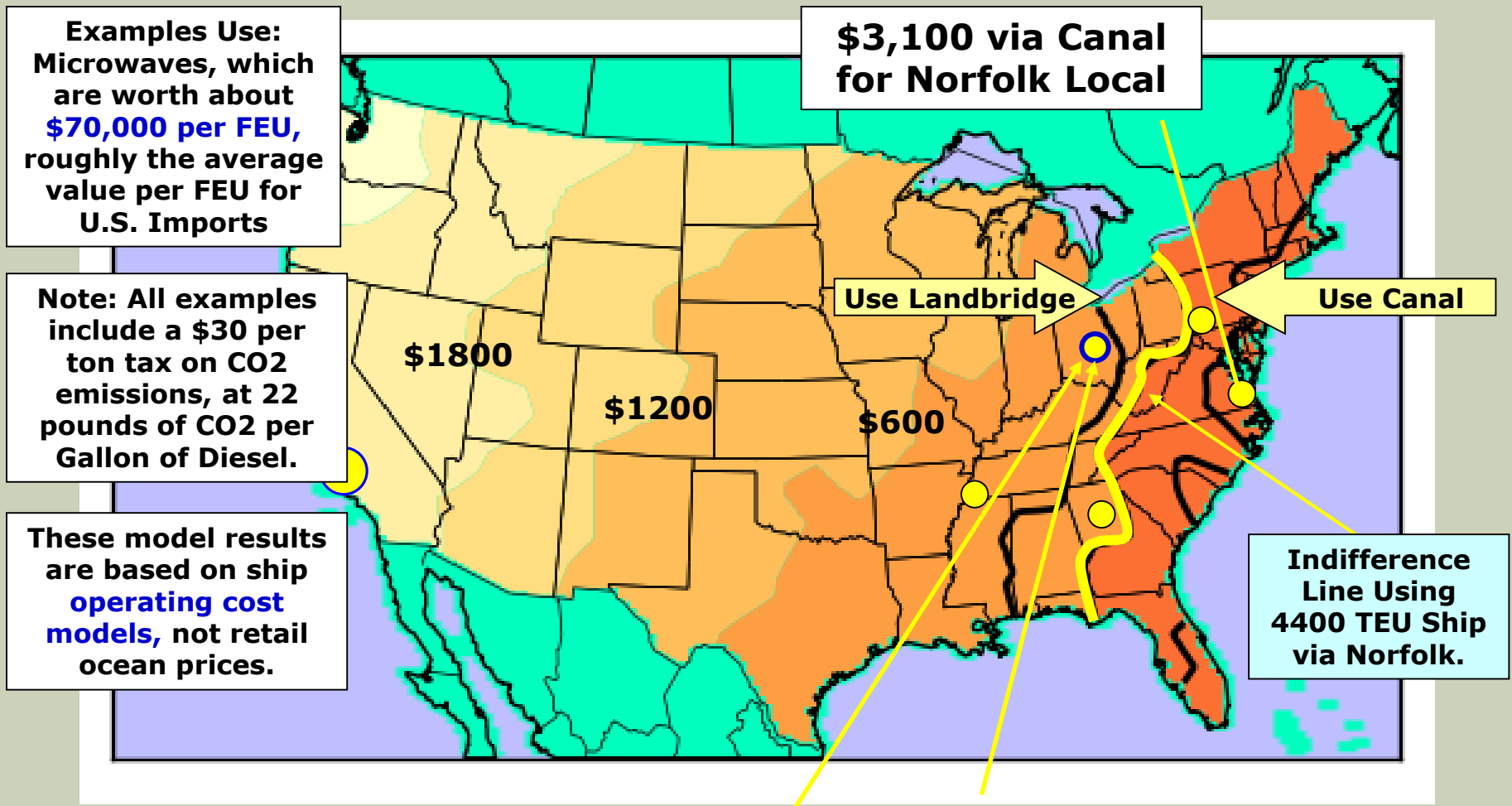


# SHIPPERS CONSIDER MUCH MORE THAN OCEAN SHIPPING RATES WHEN DESIGNING A SUPPLY CHAIN

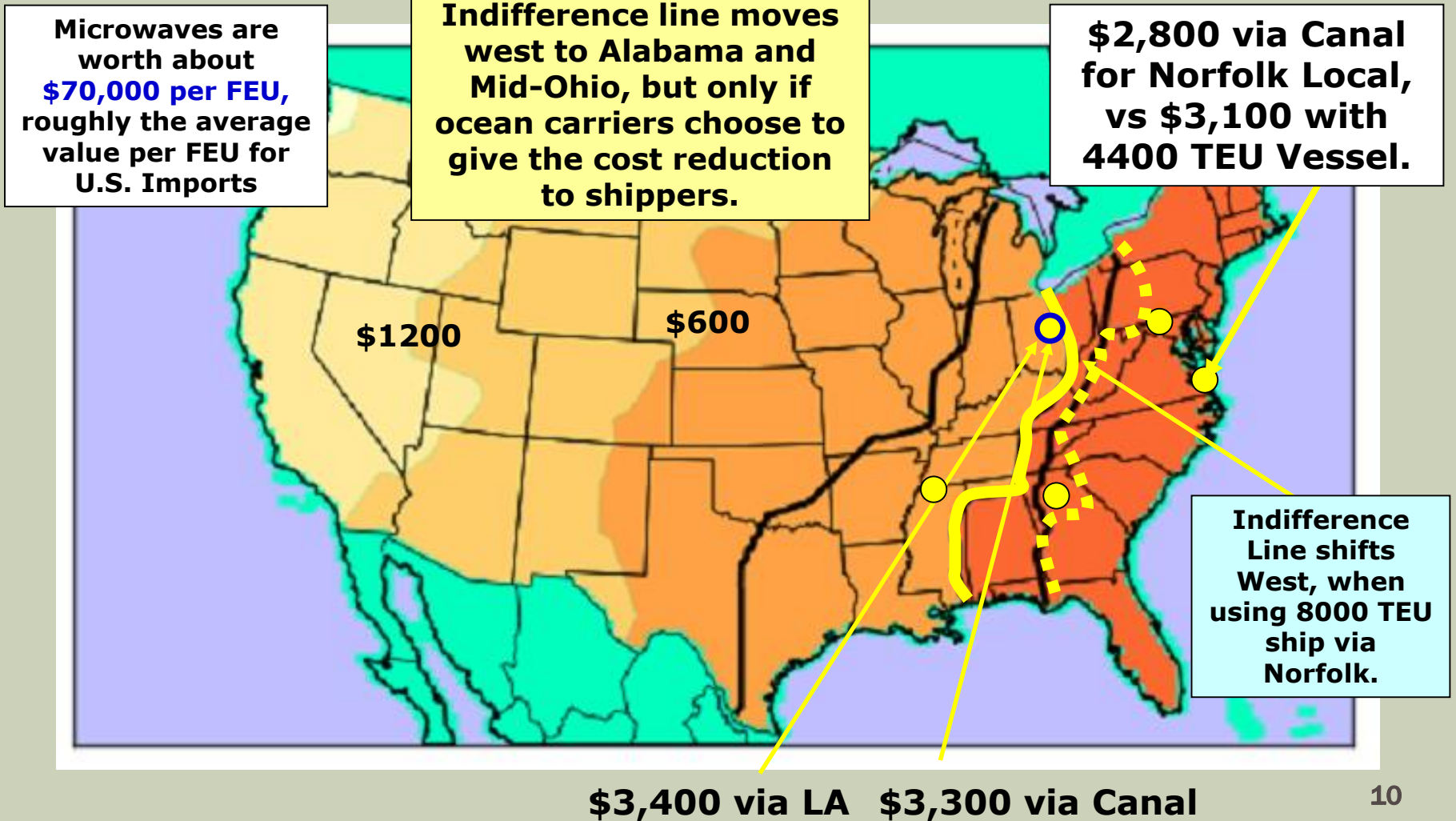
- **Transportation Costs**
  - Truck or rail to port
  - Port to port ocean costs
  - Canal and port fees
  - Intermodal or truck for land-based line haul
  - Drayage truck to DC or store
- **Inventory Costs**
  - Warehousing and origin accumulation before shipment
  - In-transit pipeline days
  - Value decay as shelf life is consumed in transit
  - Safety stock to cover transit reliability and demand fluctuations
- **Other Costs**
  - Transloading, mixing and consolidation services
  - Projected carbon footprint tax
  - Location-switching costs for IT and other structural elements



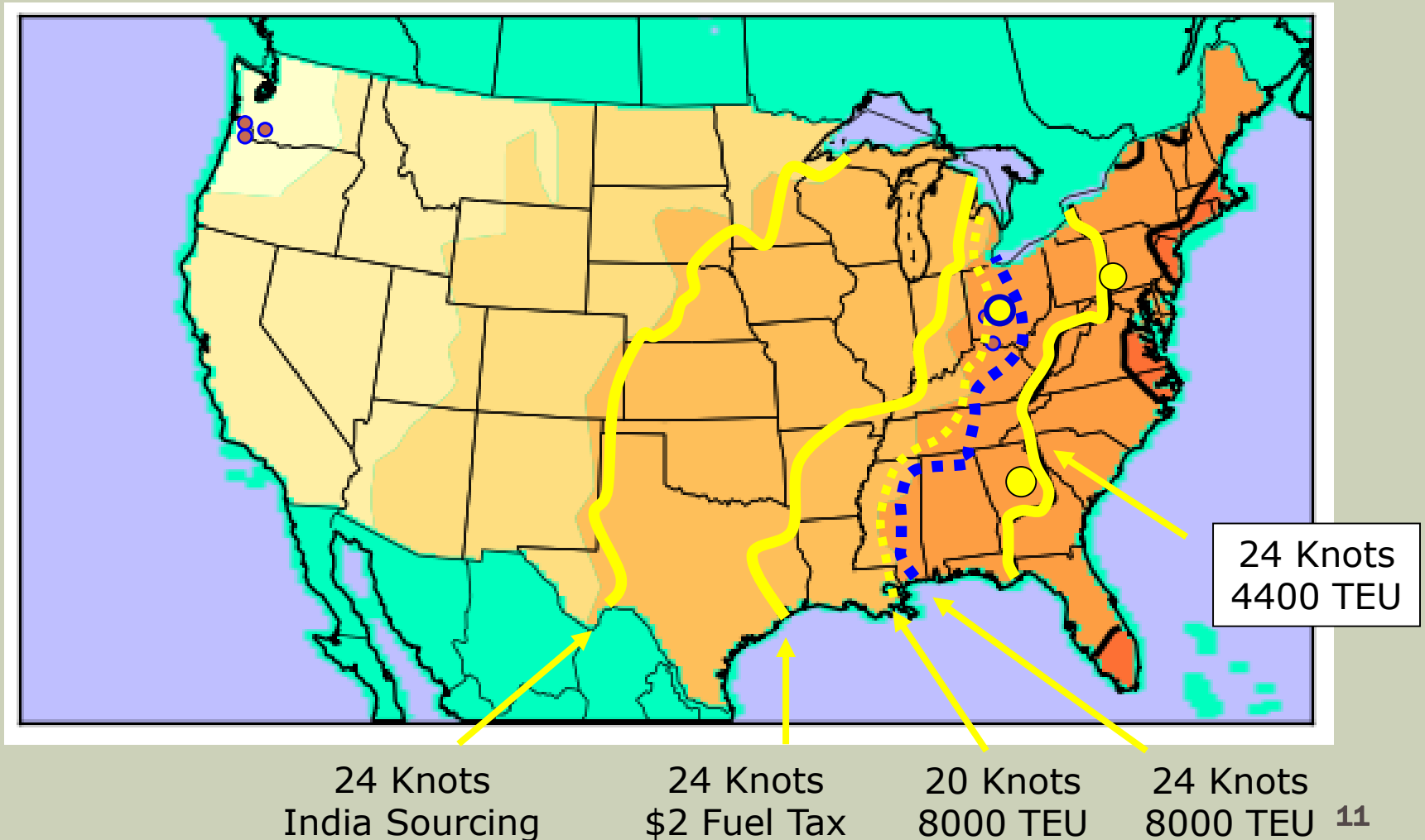
# APPLYING THE ESTIMATED SHIPPER ECONOMICS TO EACH PORT GENERATES A LINE OF INDIFFERENCE



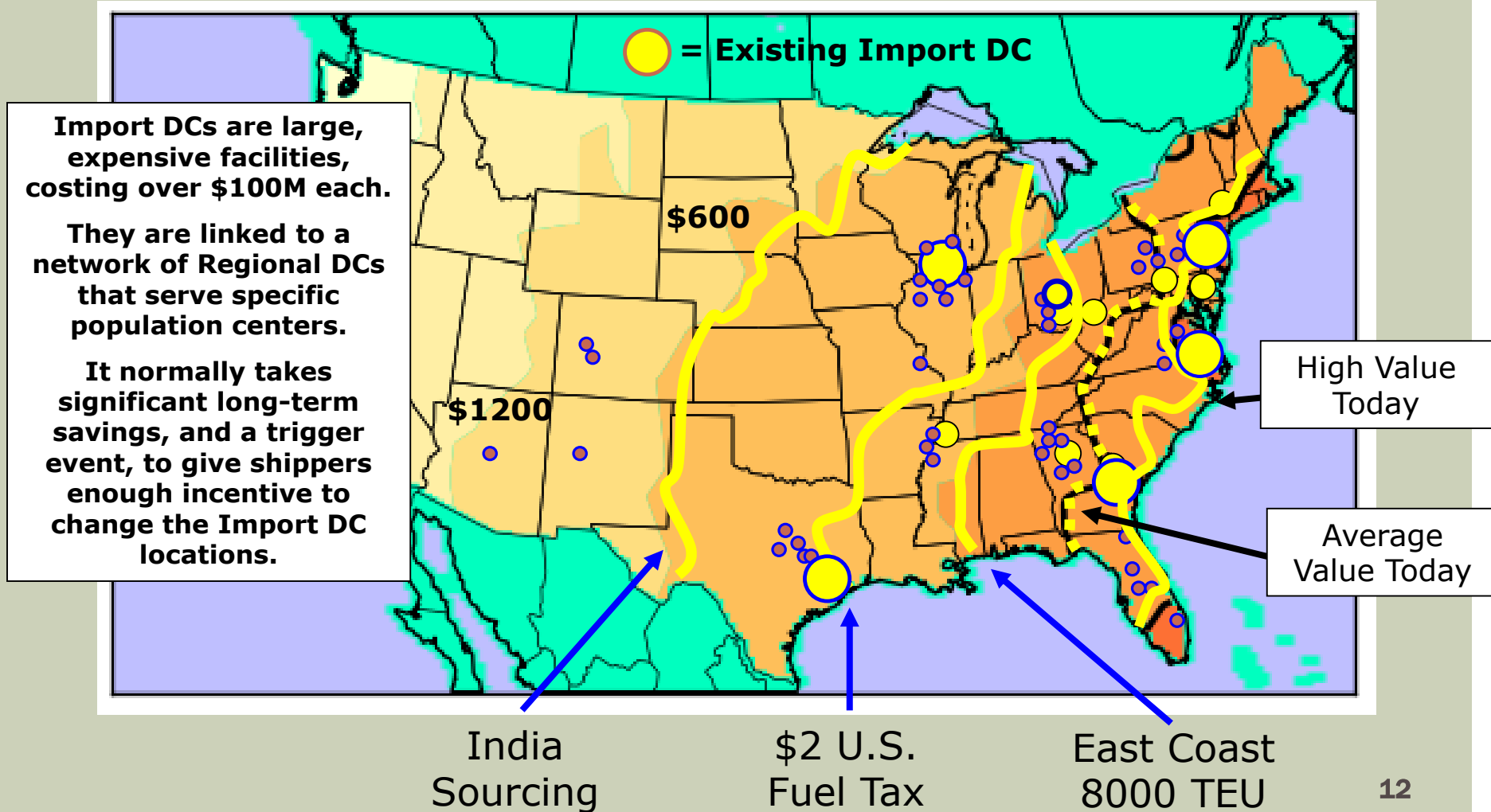
# INCREASING SHIP SIZE TO 8000 TEU VIA THE EAST COAST LOWERS OCEAN CARRIER COSTS ABOUT \$300



# AVERAGE-VALUE GOODS: INDIFFERENCE LINE SHIFTS WEST WITH FUEL TAX, SLOW STEAMING AND SHIP SIZE



# SHIPPER CHANGES WILL NOT BE IMMEDIATE: POTENTIAL SHIFTS MUST BE VIEWED IN AN EXISTING DISTRIBUTION CENTER CONTEXT



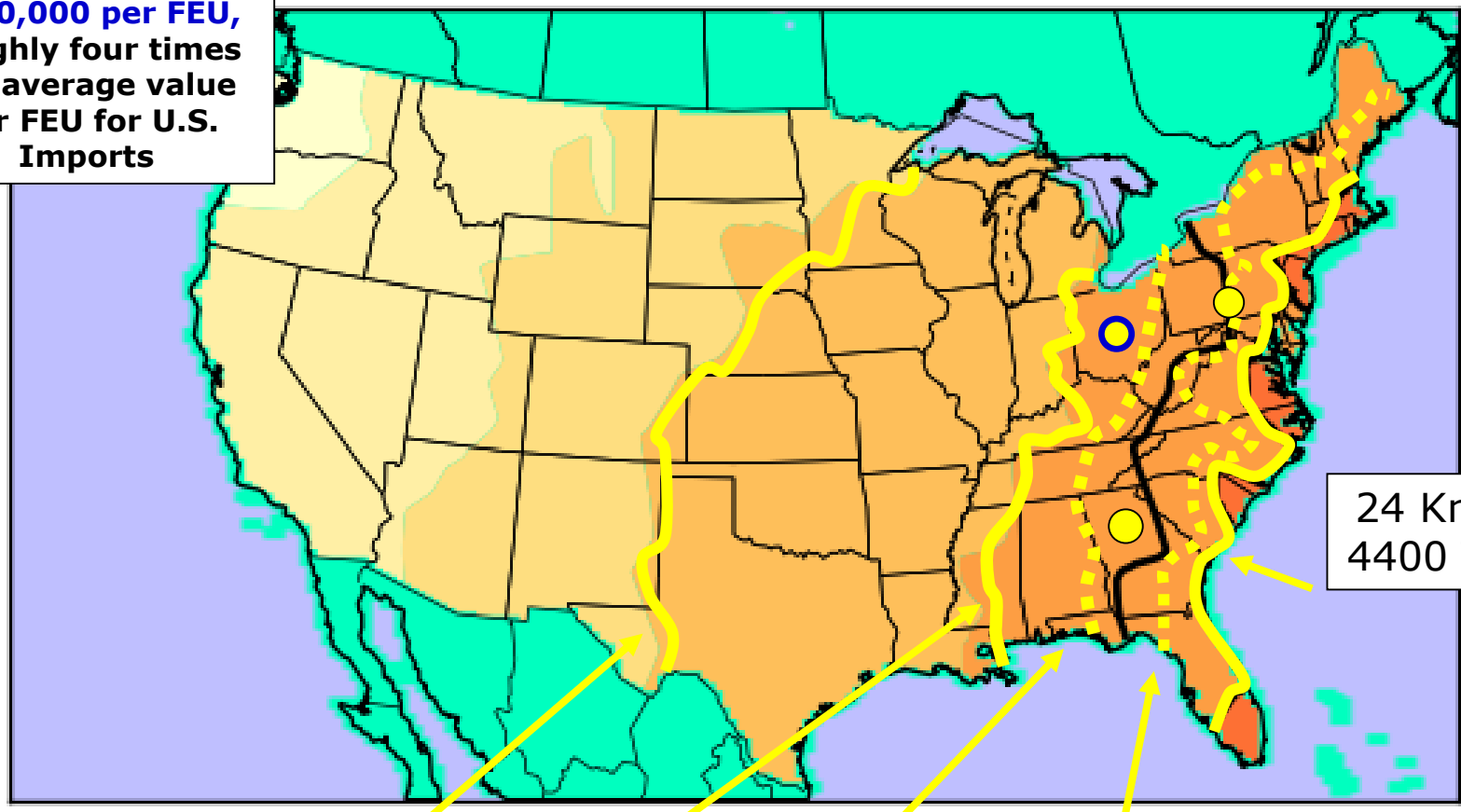
# THE ABILITY TO MOVE LARGER SHIPS WILL CREATE MORE OPTIONS FOR TRADE

- Canal flows are important for the U.S.
  - Good import economics for Far Eastern containers
  - Supports chemical and grain exports from the U.S. Gulf Coast
  - LNG ships will be able to move between Atlantic and Pacific
- Ocean container carrier costs decline if larger ships are repositioned from other lanes
  - Shippers will push to capture savings
  - Ocean carriers must balance market share versus holding price
  - Vessel size and vessel frequency will have an impact on local operators
  - West Coast ports will push to improve productivity
- East Coast ports will continue investing so that they can compete for a share of larger vessels from all trade lanes

# APPENDIX

# HIGH-VALUE GOODS: CURRENT INDIFFERENCE LINE HUGS THE EASTERN SHORE, THEN MOVES WEST

Shoes worth about **\$300,000 per FEU**, roughly four times the average value per FEU for U.S. Imports



24 Knots  
4400 TEU

24 Knots  
India Sourcing

24 Knots  
\$2 Fuel Tax

24 Knots  
8000 TEU

20 Knots  
8000 TEU