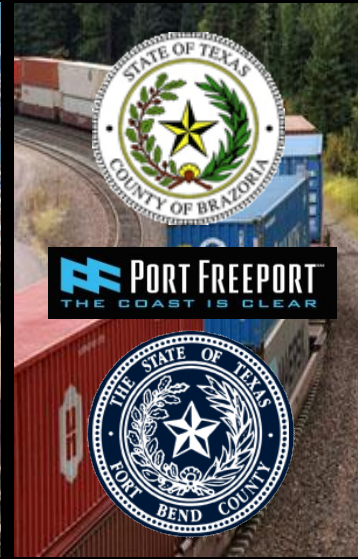


PRESENTATION TO:

HOUSTON-GATEWAY TO THE AMERICAS CONFERENCE

IMPACT OF THE PANAMA CANAL AND MARKET OPPORTUNITY FOR TEXAS



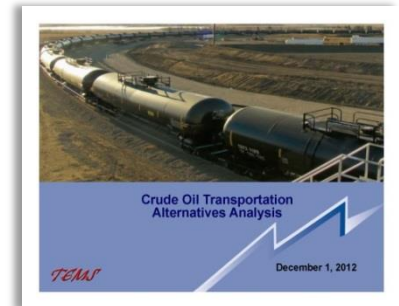
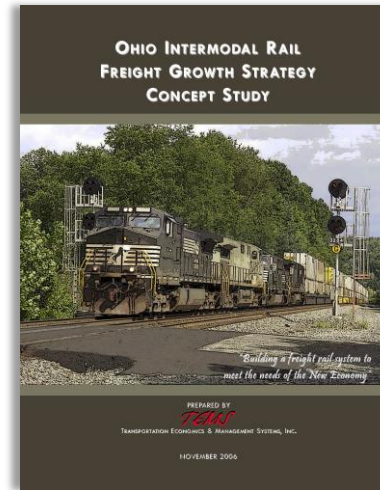
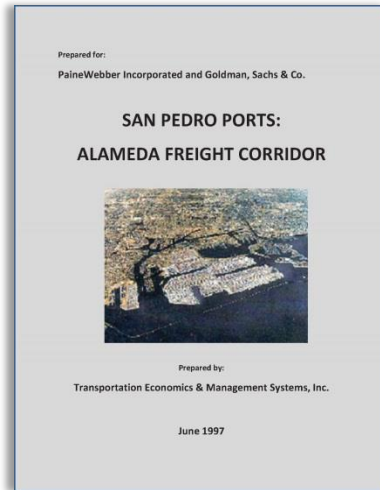
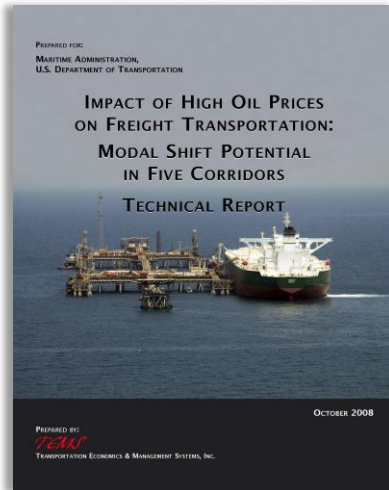
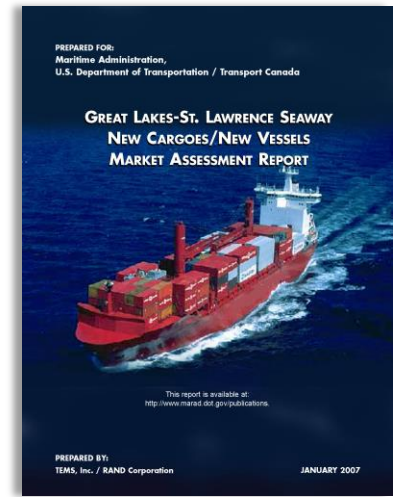
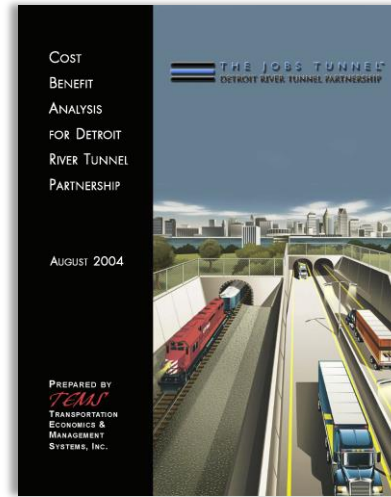
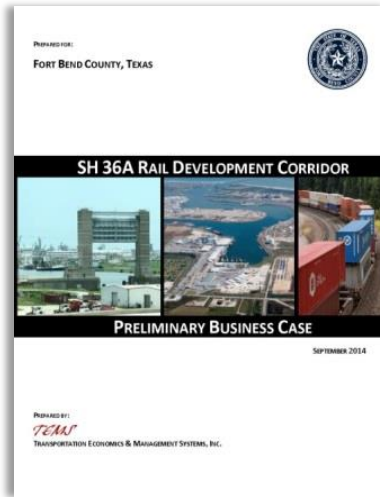
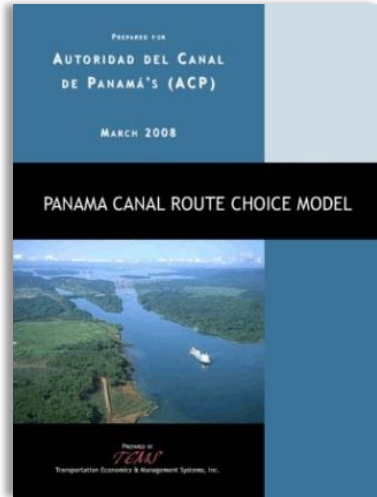
Presentation By

TEMS

Transportation Economics & Management Systems, Inc.

DECEMBER 2, 2015

TEMS KEY EXPERIENCE



TEXAS IS GROWING STRONGLY



- Texas GDP has been growing by 7 percent each year
- Texas added 1.3 million people from 2010 to 2013
- Population to grow from 26 million today to 40 million by 2050.



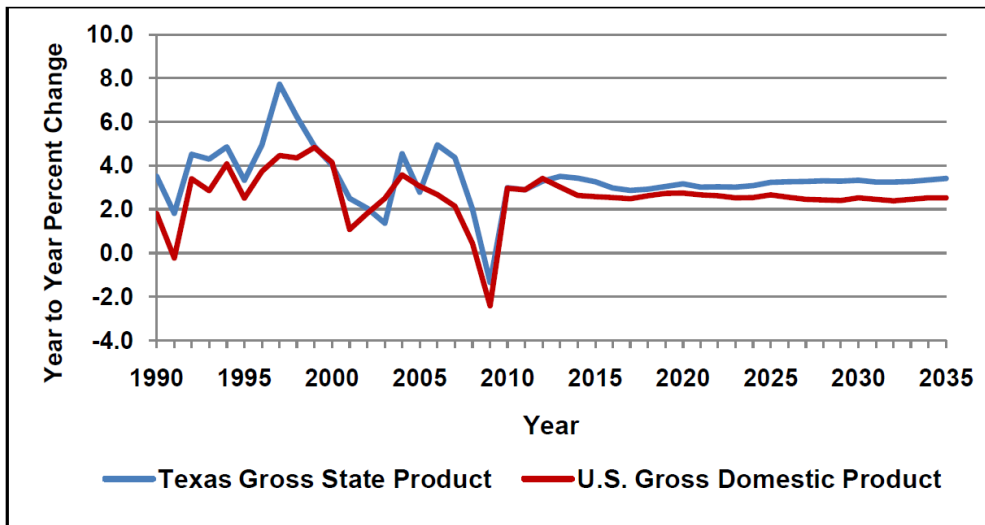
Texas Transportation System needs increase efficiency and capacity to meet future needs.

SUSTAINED GROWTH IS FORECASTED



Historically, Texas GDP growth rate has been significantly higher than US growth Rate. “Forecasts from the Texas Comptroller of Public Accounts predict that the U.S. and Texas economies will rebound from the current recession (in terms of GSP and GDP), and grow at 2.6 percent and 3.37 percent, respectively, on average, per year between 2010 and 2035 (Figure 2-1).⁷ An efficient and well-maintained transportation system is vital to the state’s ability to remain economically competitive at home and abroad.”

Figure 2-1: Comparative Annual Economic Growth, 1990 to 2035



* Source: Texas Statewide Long-Range Transportation Plan 2035 at:
http://ftp.dot.state.tx.us/pub/txdot-info/tpp/rural_2035/report/slntp_final_ch2.pdf

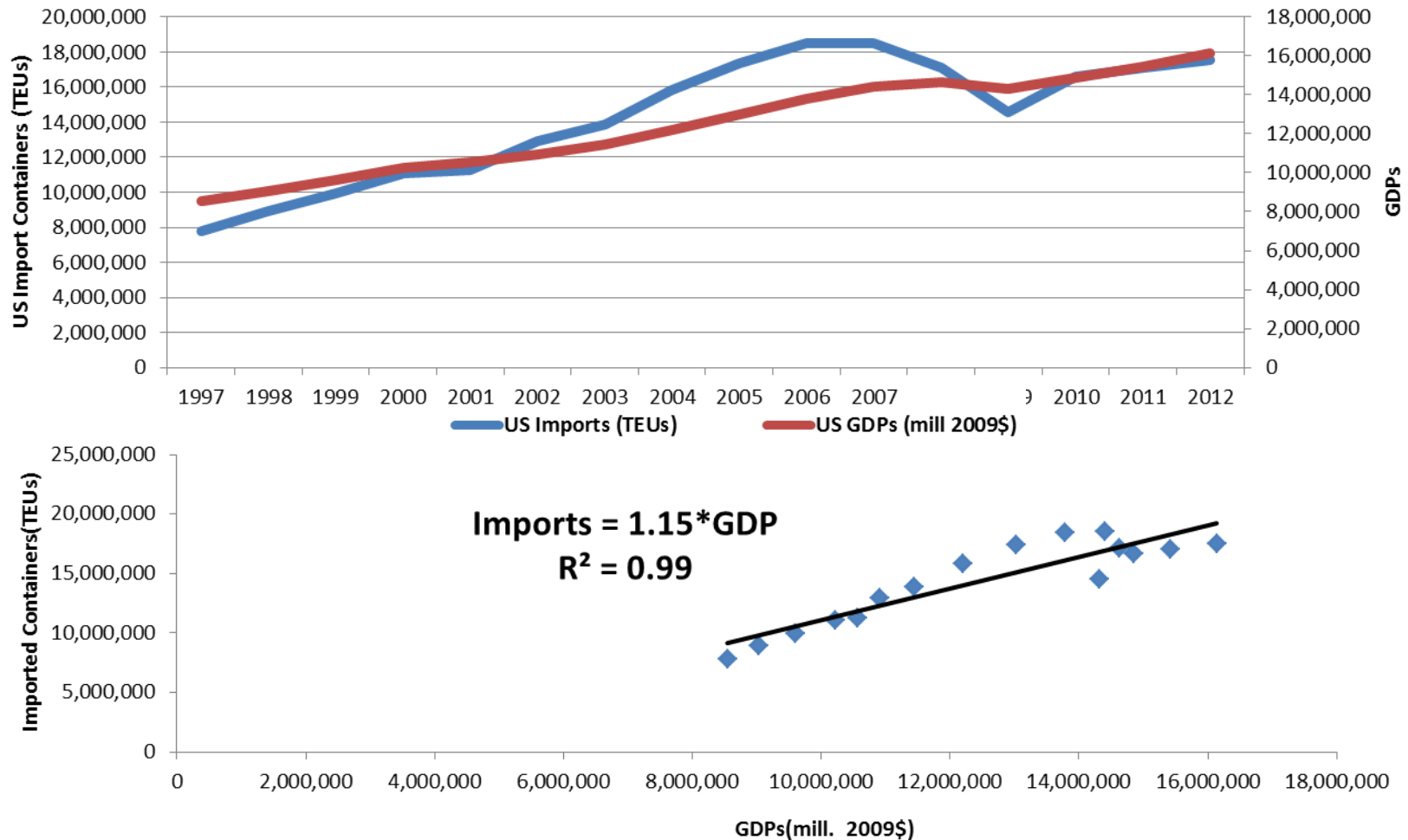
The Texas Comptroller
Forecast is in **REAL DOLLARS**

Adding a 2% annual inflation
gets us right back into the
5+% range.

**Average growth rate will be
5.4% (NOMINAL DOLLARS)
for the Texas market area**

CONTAINER IMPORTS ARE CLOSELY LINKED TO NOMINAL GDP

FEASIBILITY



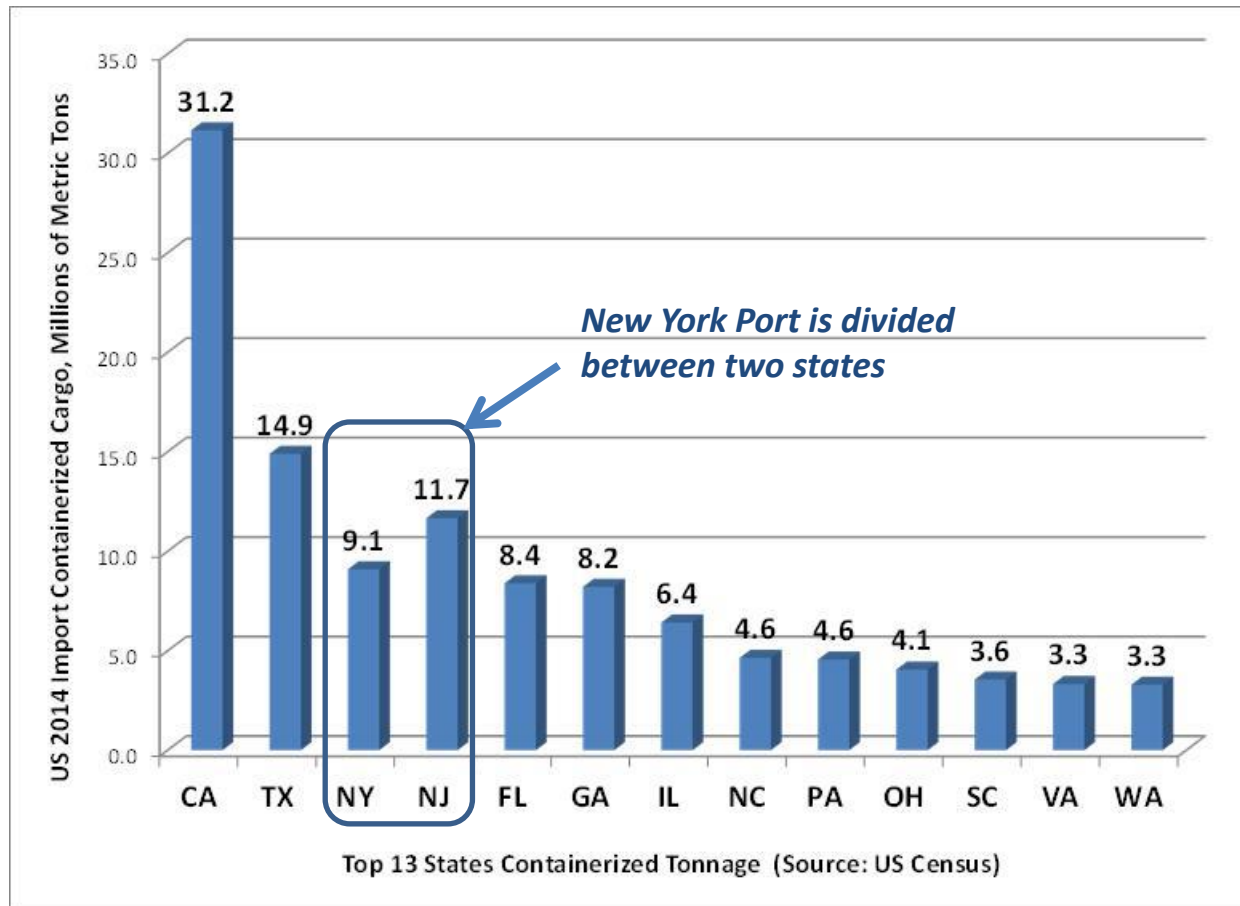
Growth rate has only been moderated by recent recession.

TEXAS MARKET IS 3RD LARGEST IN THE US

FEASIBILITY



ONLY AFTER CALIFORNIA AND NY/NJ (WHICH IS DIVIDED BETWEEN THE TWO STATES)

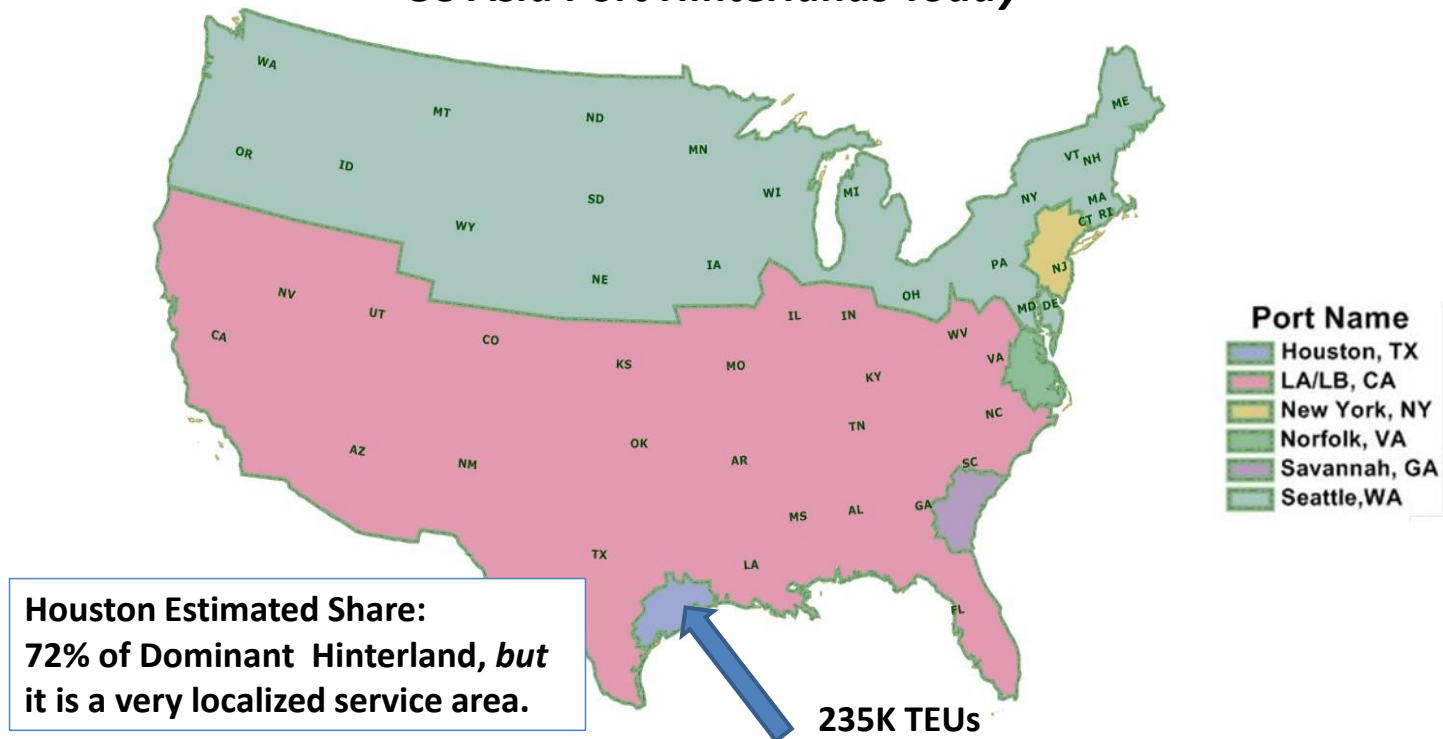


HOWEVER, DFW AND MOST OF TEXAS ARE CURRENTLY SERVED OUT OF LA/LB

FEASIBILITY

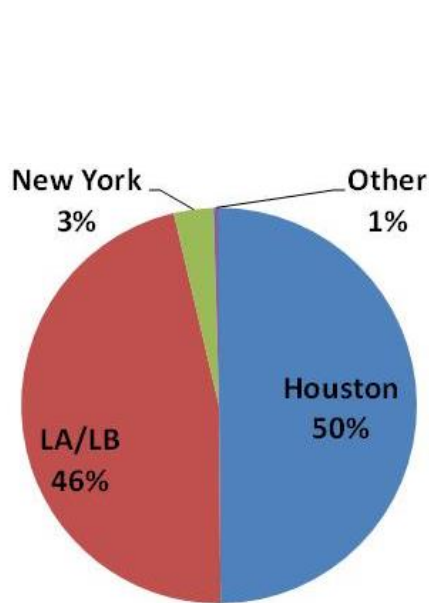


US Asia Port Hinterlands Today

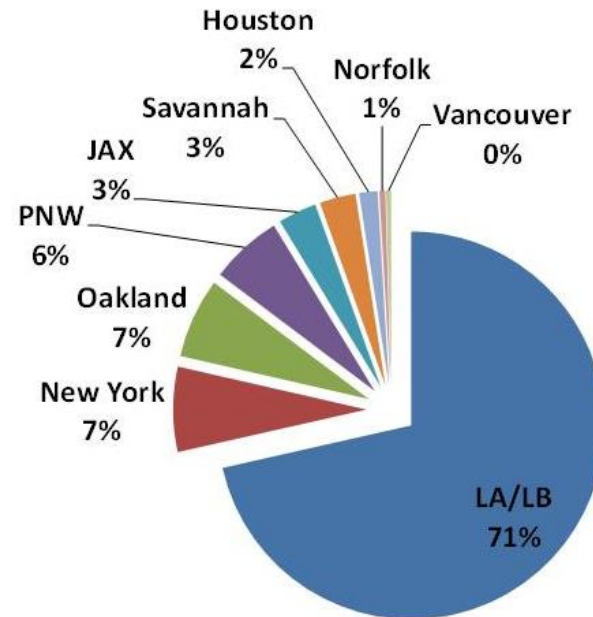


This is due to big ships on the West Coast versus small ships in Houston; but Houston fares no worse than East Coast Ports in regard to serving only its local (truck) port hinterland area. Most of Houston's traffic today is European and Caribbean-based.

CURRENTLY HOUSTON'S SHARE OF ASIAN CONTAINERS IS 22% OF TEXAS MARKET



HOUSTON

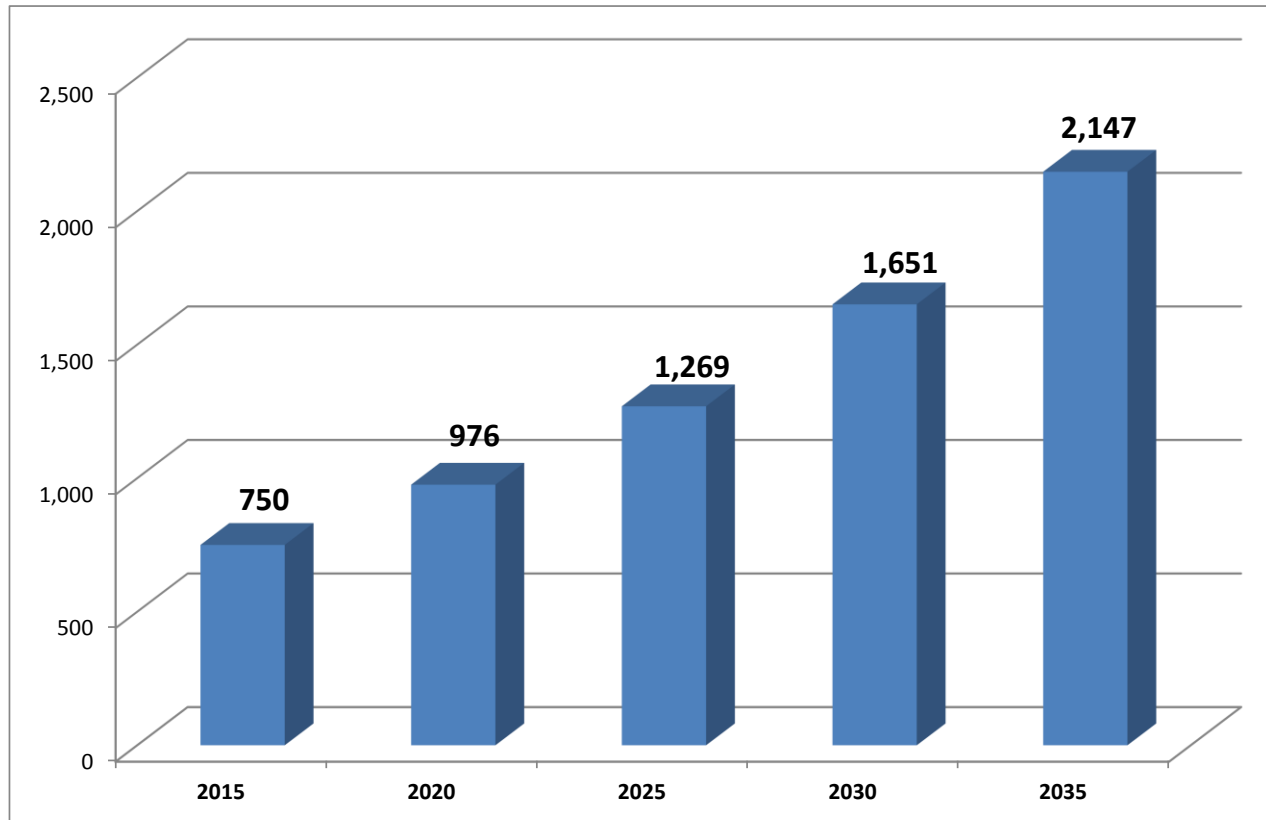


DALLAS-FORT WORTH

This results from the economics of small ships, where small vessels currently hold more than 50% market share vs. the West Coast in Houston. Houston currently has only a negligible share of DFW market, but Texas ports share will increase with large ships provided they have effective access to the DFW market.

DFW ASIAN CONTAINER MARKET WILL GROW BY A FACTOR OF THREE

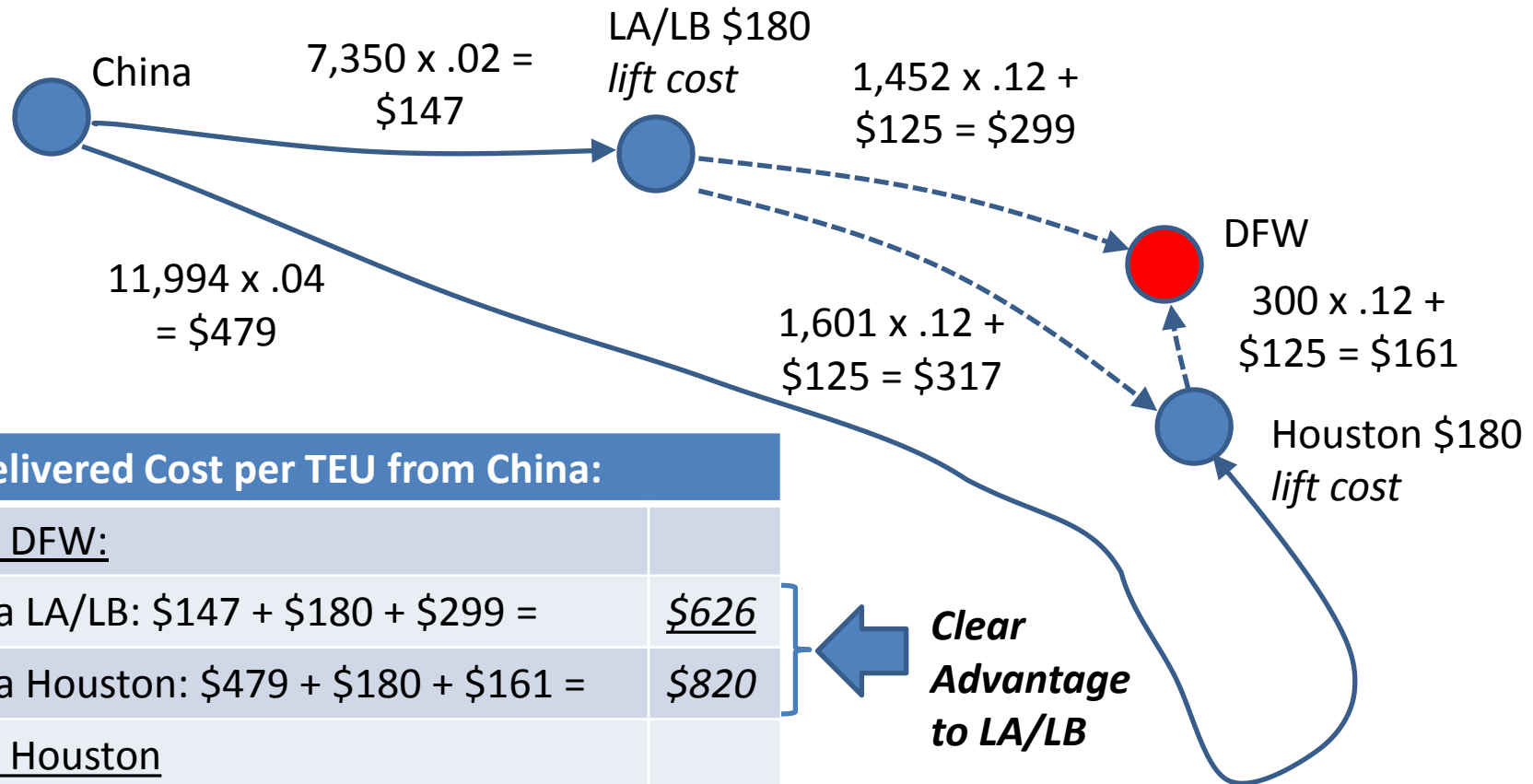
FEASIBILITY



This growth will put a lot of strain on existing rail infrastructure and capacity

CURRENT COST TRADEOFF: SMALL SHIPS

FEASIBILITY



Delivered Cost per TEU from China:

To DFW:

Via LA/LB: $\$147 + \$180 + \$299 =$ \$626

Via Houston: $\$479 + \$180 + \$161 =$ \$820

To Houston

Via LA/LB: $\$147 + \$180 + \$317 =$ \$644

Via Houston Direct: $\$479 + \$180 =$ \$659

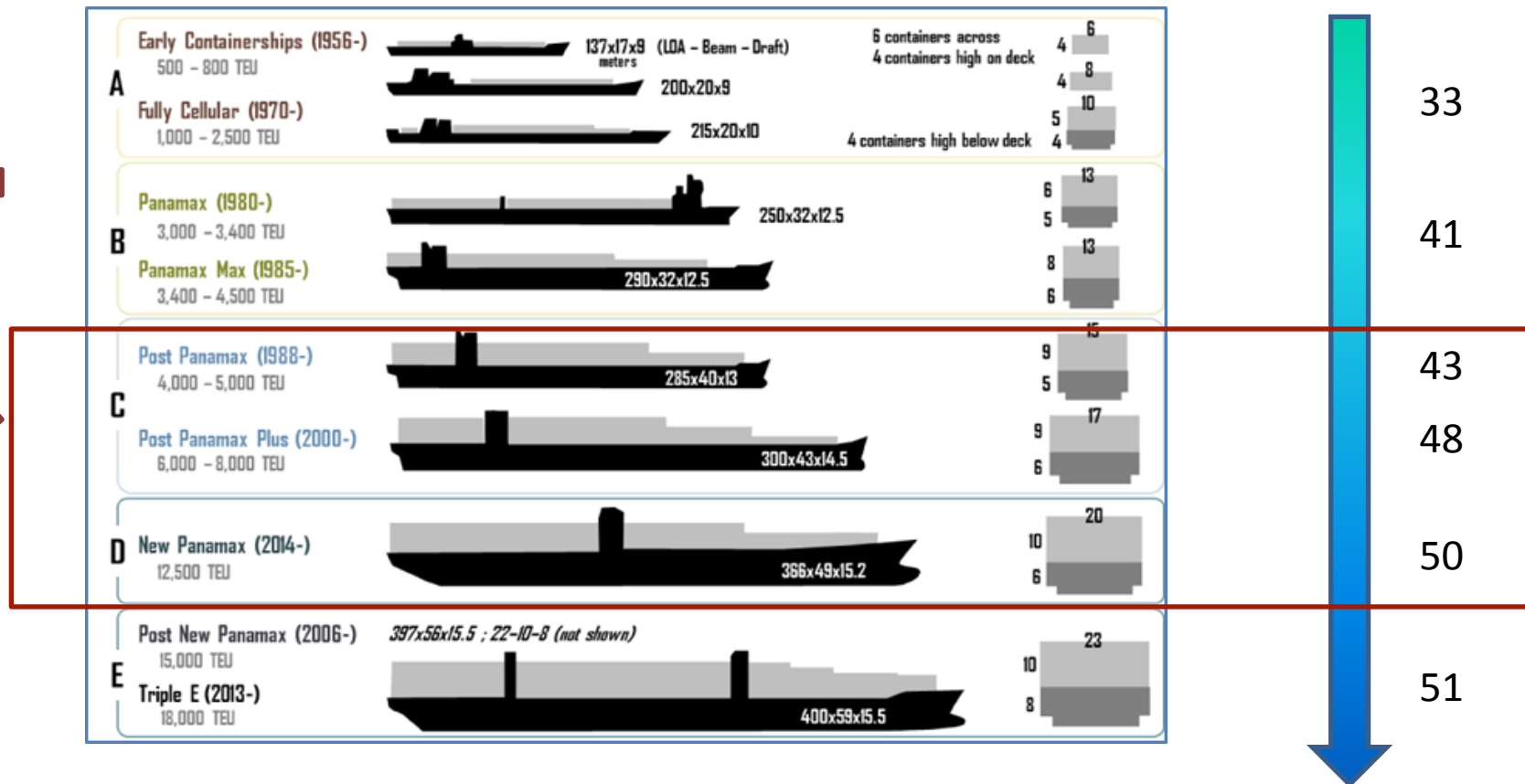
**Clear
Advantage
to LA/LB**

About Equal

PANAMA CANAL WILL CHANGE THE SITUATION



Water Depth(ft)

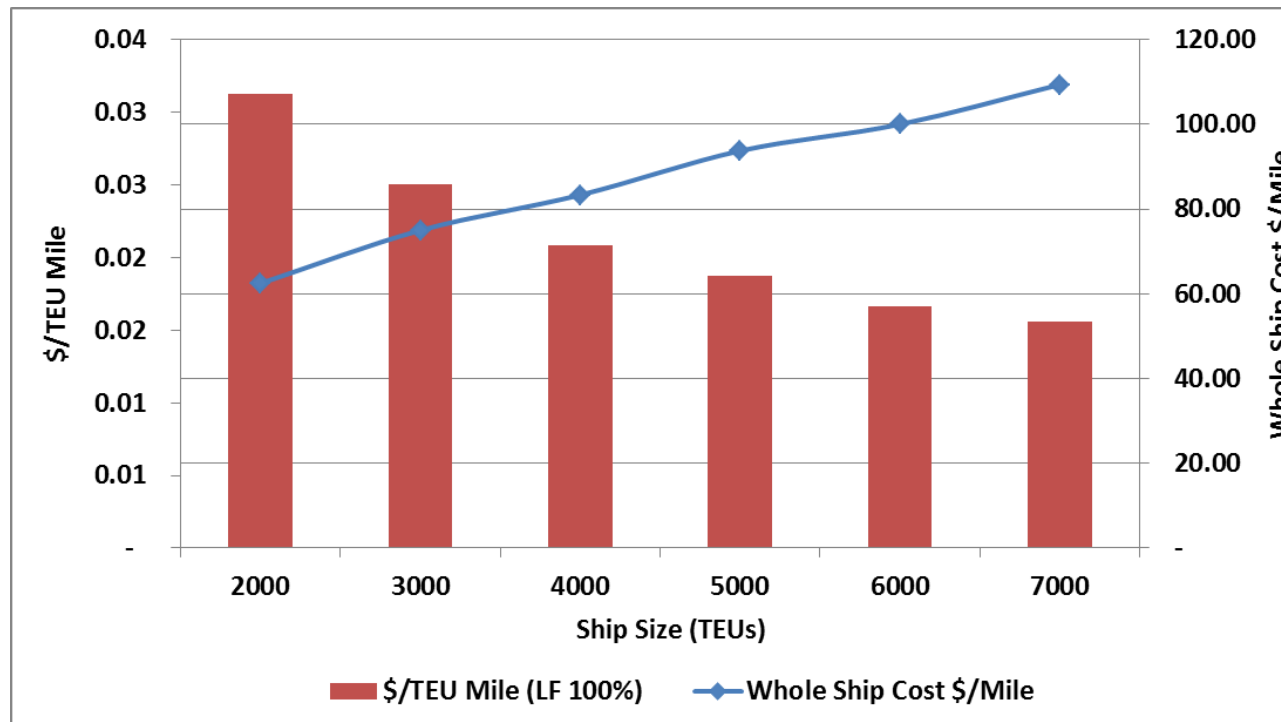


Capacity of New Panamax ship will increase 2-3 times, but requires 48-51 feet draft. Only a few Gulf and East Coast ports can support this, but in the long term Freeport will be able to accommodate these larger ships.

ECONOMIES OF SCALE FOR BIGGER SHIPS



Source: Reproduced based on Figure 4.3 Impacts of Containership Size, Service Routes, and Demand On Texas Gulf Ports , TXDOT, 2001



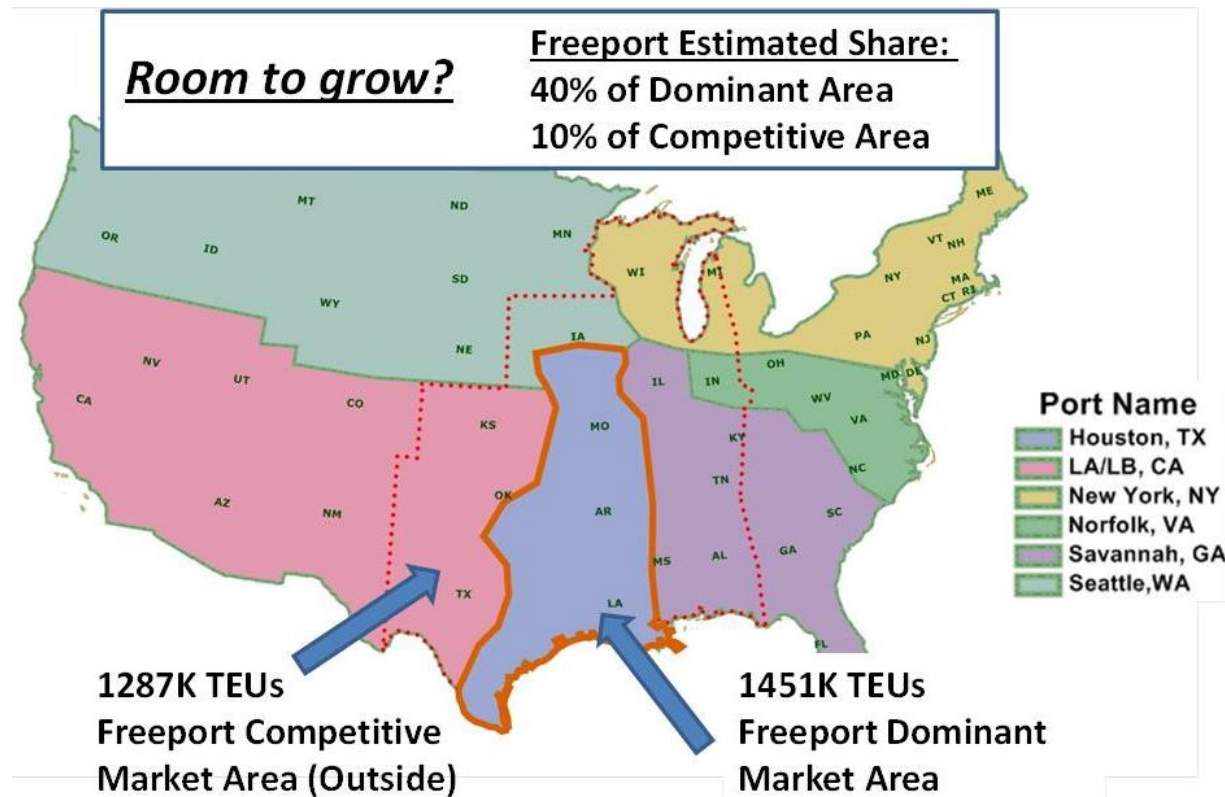
- 2015 Shipping cost will decrease from \$0.04/TEU·Mile to \$0.02/TEU·Mile (70% loading factor and inflation since 2001).
- **This cuts shipping line-haul costs in half.**
- East Coast Ports are expanding their capabilities, so Big Ships will be used in both Pacific and Atlantic (e.g. Suez) trade lanes.

BIG SHIPS COME TO THE GULF AND EAST COAST FROM ASIA. THIS TIPS THE COMPETITIVE BALANCE

FEASIBILITY



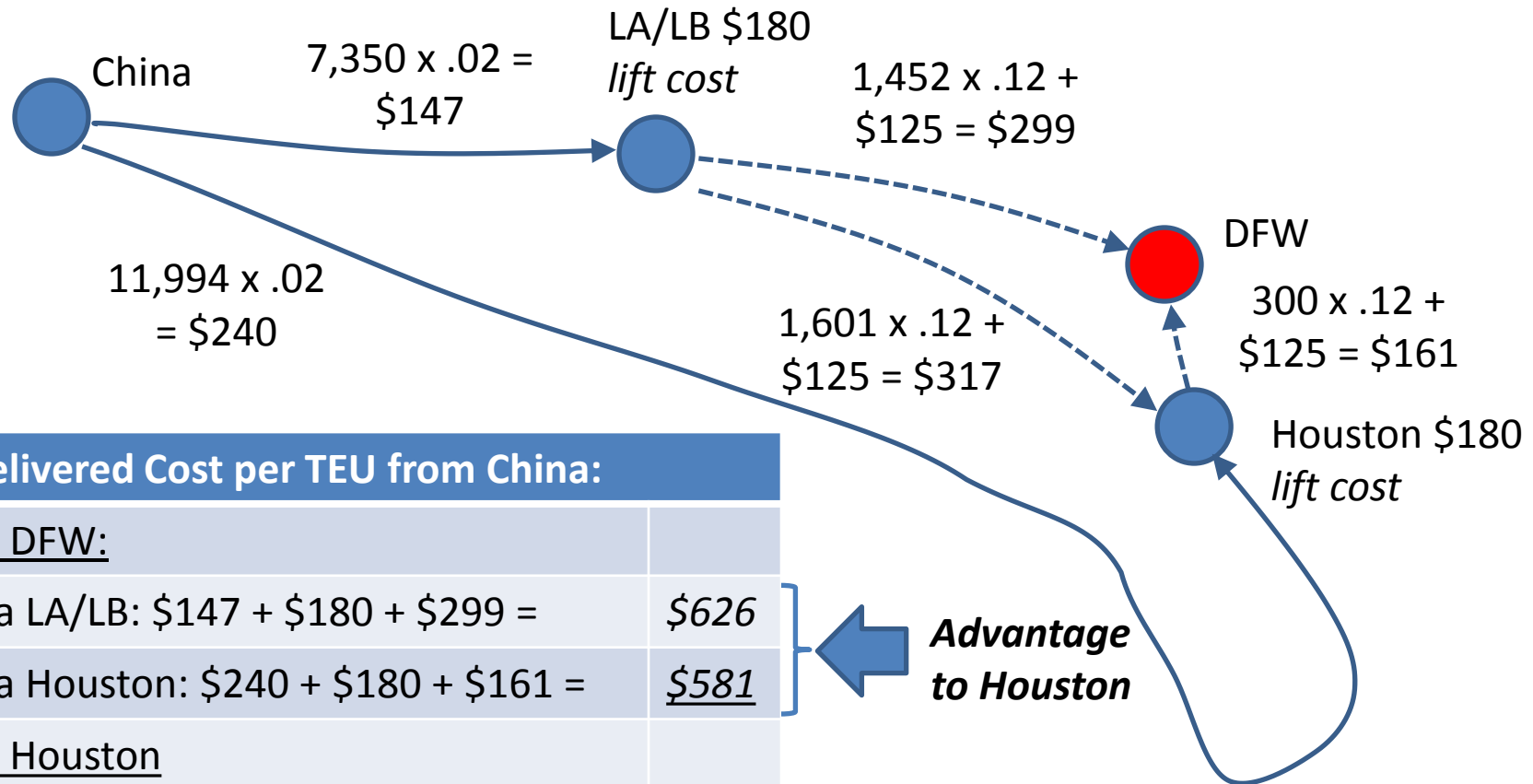
After Panama Canal Expansion



The Competitive Balance with the West Coast Ports will change dramatically if a South Texas port has 50 feet of water and an effective inland distribution network

FUTURE COST TRADEOFF: LARGE SHIPS

FEASIBILITY



Delivered Cost per TEU from China:

To DFW:

Via LA/LB: $\$147 + \$180 + \$299 = \626

Via Houston: $\$240 + \$180 + \$161 = \underline{\$581}$

To Houston

Via LA/LB: $\$147 + \$180 + \$317 = \644

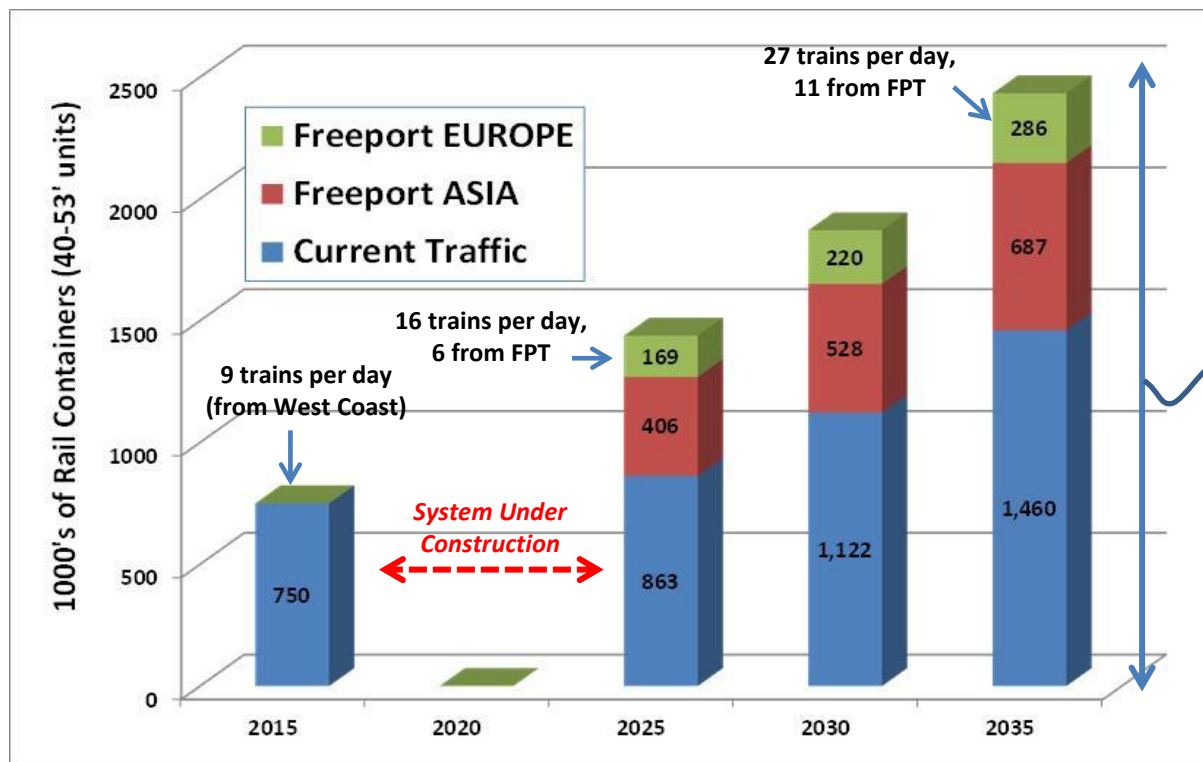
Via Houston Direct: $\$240 + \$180 = \underline{\$420}$

**Advantage
to Houston**

**Clear
Advantage
to Houston**

CONTAINER MARKET SHARE AT DFW

FEASIBILITY



With Large-Vessel economics and a rail connection, Freeport can compete at DFW.

A forecasted more than tripling of rail intermodal demand by 2035 will put considerable pressure on both rail line and terminal capacity in Texas

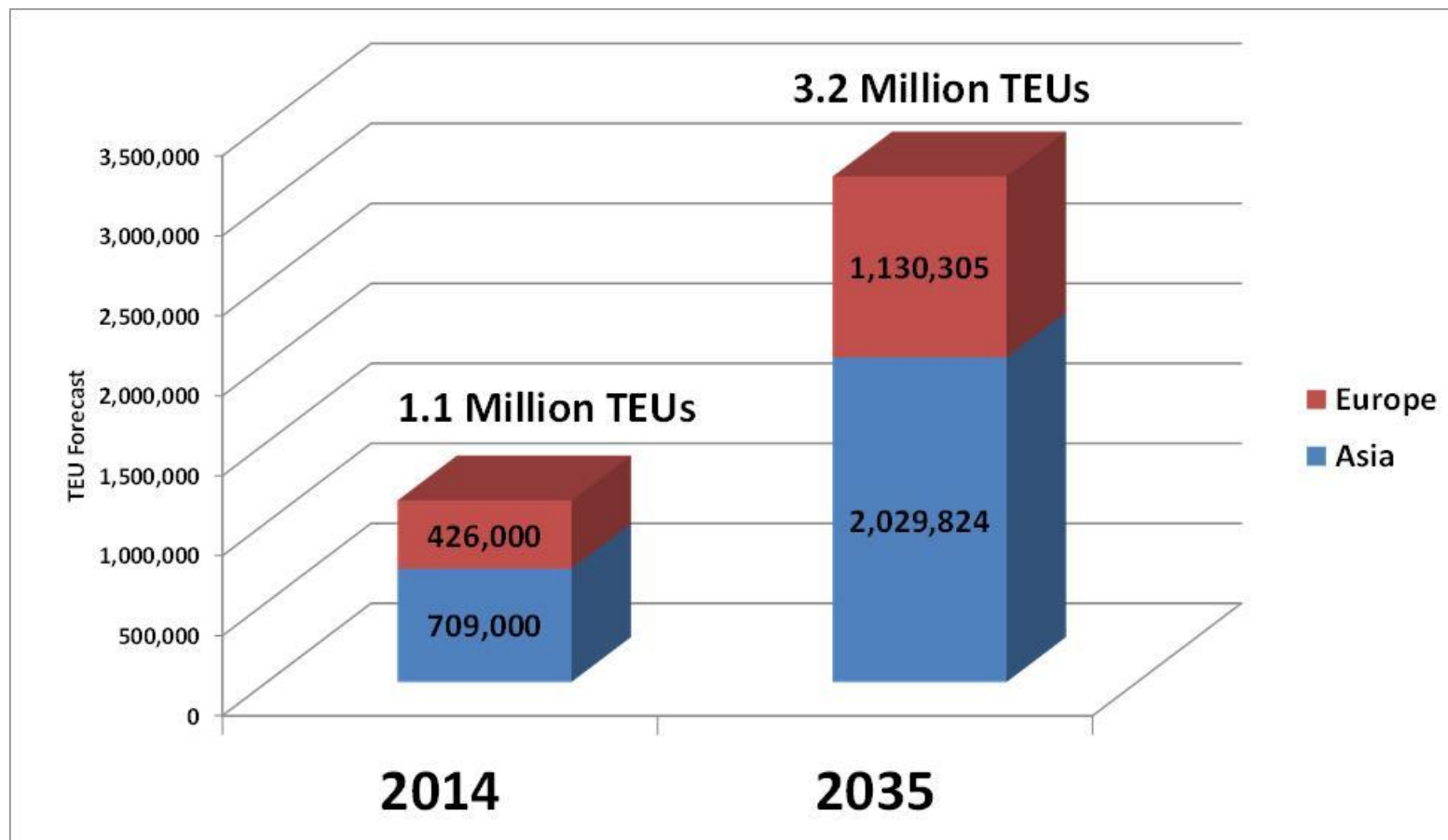
Notes:

1. Estimate approx. 750,000 containers total IMX market in and out of DFW today.
2. Freeport will come online between 2020 and 2025. By 2025 fully operational.
3. Freeport would add rail European boxes that are currently trucked which results in an immediate boost in rail traffic

Freeport Europe FEU
Freeport Asia FEU
Existing Rail FEU



OVERALL FREEPORT CONTAINER MARKET FORECAST



RAIL INTEGRATION FOR PORT FREEPORT

FEASIBILITY



Concept Study envisioned

- *Port Freeport Improvements*
- *Rail Link to Inland Ports at:*
 - *Dallas*
 - *Fort Worth*
 - *San Antonio*
- *Integrated Hub at:*
 - *Rosenberg*

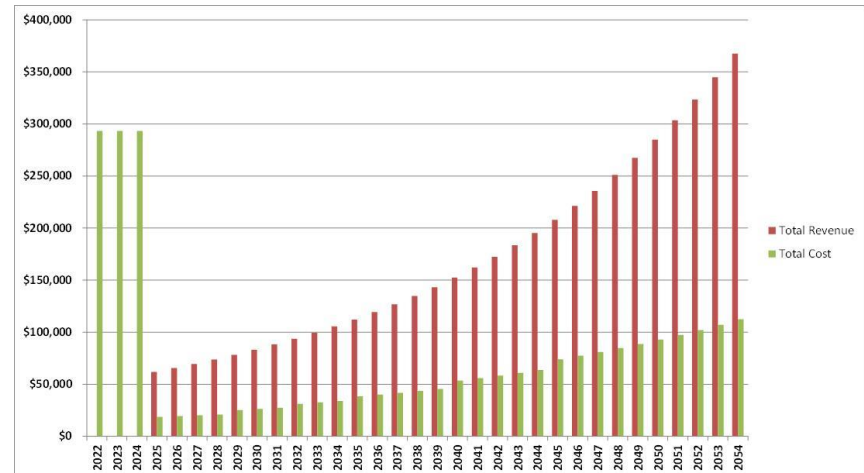


PRELIMINARY FINANCIAL ANALYSIS

FEASIBILITY



IMX Revenues	\$1,633,683
Car Revenues	\$405,251
Total Revenue	\$2,038,934
GF Capital Cost	\$807,769
Track Mtce Cost Oper	\$389,014
Track Mtce Cost Cap	\$189,503
Admin Cost	\$85,635
Total Cost	\$1,471,922
NET	\$567,012
IRR	7.79%



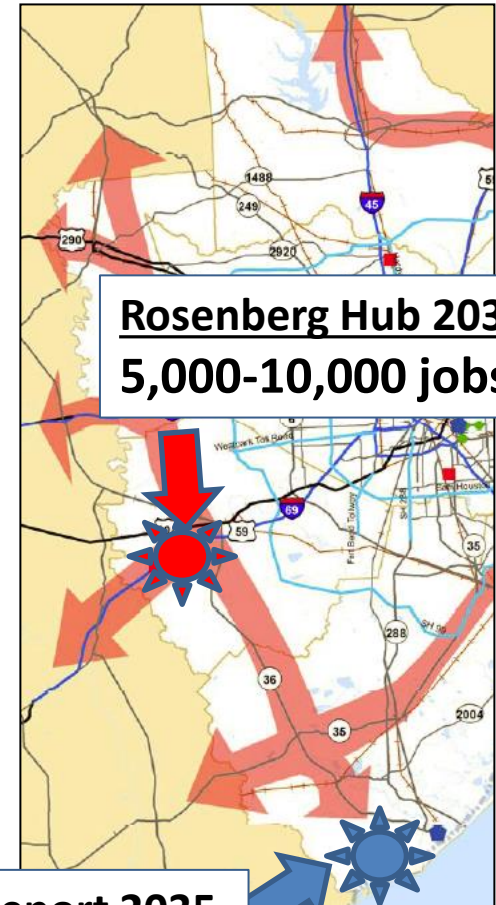
- **Conceptual Analysis undertaken from the point of view of the Railroad Authority, in nominal year of expenditure (YOE) dollars. Freeport to Caldwell est. cost \$880 million assumed in operation by 2025**
- **This analysis is based on 40¢ per car mile and \$28.41 per Loaded TEU (assuming 100% empty return)**
- **Due to the length of the route and forecasted tonnage, operating and capital maintenance is a significant component of the corridor's cost structure, which must be recovered through usage fees.**
- **At a competitive tolling level and existing carload traffic north of Rosenberg to Caldwell; 4.4% interest and 1.4% inflation the NPV is \$567 million positive: this suggests that an infrastructure authority could fully service its Bonds from fees without needing subsidy or grant assistance.**
- **More study is needed to positively confirm costs and revenues, but suggests potential for a RRIF loan or use of Revenue Bonds as a low-cost financing vehicle for developing needed infrastructure improvements**

SH 36A RAIL CORRIDOR JOB CREATION

FEASIBILITY



- *Current modeling suggests rail traffic volumes will continue to increase and UP and BNSF will need to develop additional rail yard capacity in the Houston area.*
- *Rosenberg is well positioned in the future to become a major rail logistics hub. Shifting intermodal activity from UP Englewood and BNSF Pearland to Rosenberg would reduce rail congestion in downtown Houston.*
- *Overall, potential is 15,000 - 30,000 jobs likely in the SH 36A corridor, mostly consisting of distribution and industrial jobs.*



Rosenberg Hub 2035:
5,000-10,000 jobs

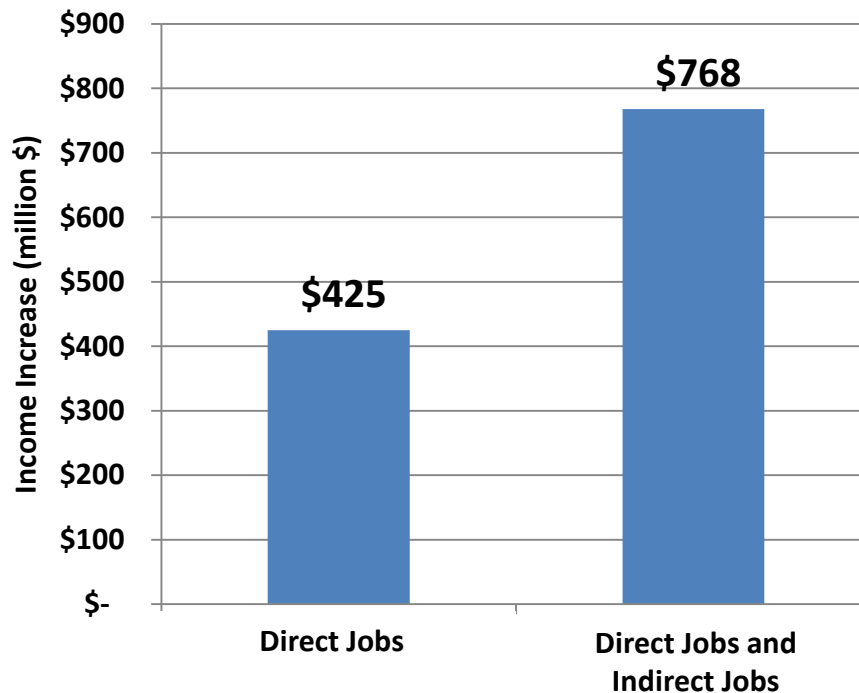
Port of Freeport 2035:
10,000-20,000 jobs.

SH 36A RAIL INCOME IMPACTS – INCOME AND SALES TAX REVENUES BY 2035

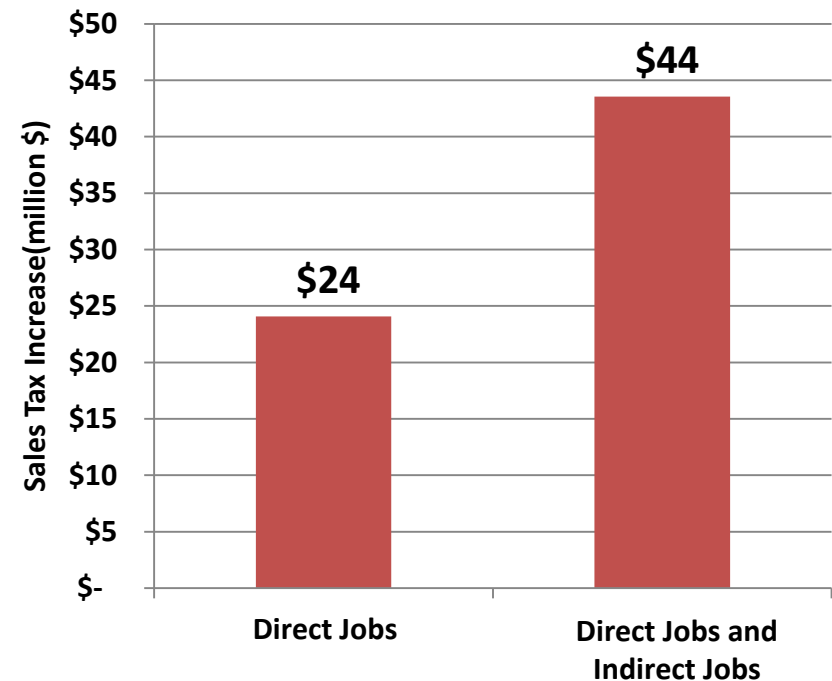
FEASIBILITY



Total Income Increase
(million \$ per Year)



Total State Sales Tax Increase
(million \$ per Year)



PORTS ALLIANCE FOR TEXAS?

FEASIBILITY



- The ports of Seattle and Tacoma joined forces in August 2015 to unify management of our marine cargo facilities and business to strengthen the Puget Sound gateway and attract more marine cargo and jobs for the region
- The ports together have nine container terminals, but none of them are currently able to effectively handle big ships.
- “We used to think, the more competition the better,” said Jock O’Connell, an international trade economist. But the advent of ultra-large ships, some of which can carry up to 20,000 cargo containers, has thrown port operations for a loop, he said.
- Bookout says if the seaports in Seattle and Tacoma want to remain a destination for cargo ships, they must invest. “We don’t have a choice,” she said. “We can’t choose to just handle small ships. We need to have the facilities that will handle the ships of the future.”



Ports of Seattle, Tacoma Agree to Alliance at <http://www.wsj.com/articles/ports-of-seattle-tacoma-agree-to-alliance-1433542075>; *Seattle, Tacoma Ports Vote to Form Alliance* <http://www.wsj.com/articles/seattle-tacoma-ports-vote-to-form-alliance-1438714867>; <https://www.nwseaportalliance.com> ; <https://www.linkedin.com/pulse/seattle-tacoma-gateway-development-strategy-unfolds-shawn-goh?forceNoSplash=true> ; <http://kuow.org/post/notice-fewer-containers-puget-sound-ports-canada-grabbed-our-business>

THANK YOU

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