

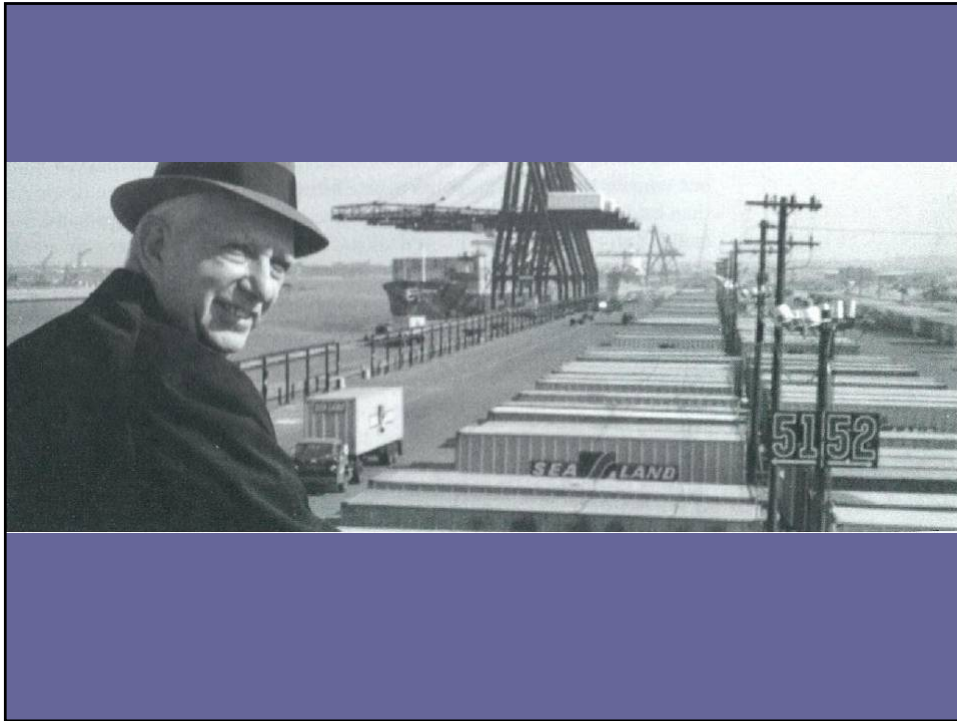
# **Planning for Container Growth Along the Houston Ship Channel and other Texas Seaports**

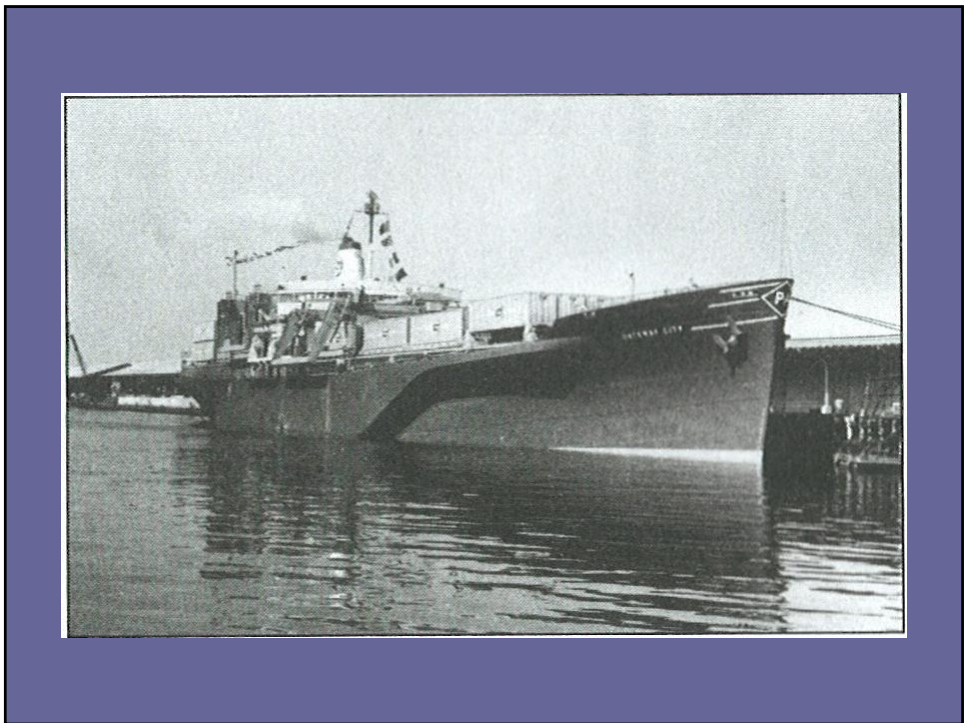
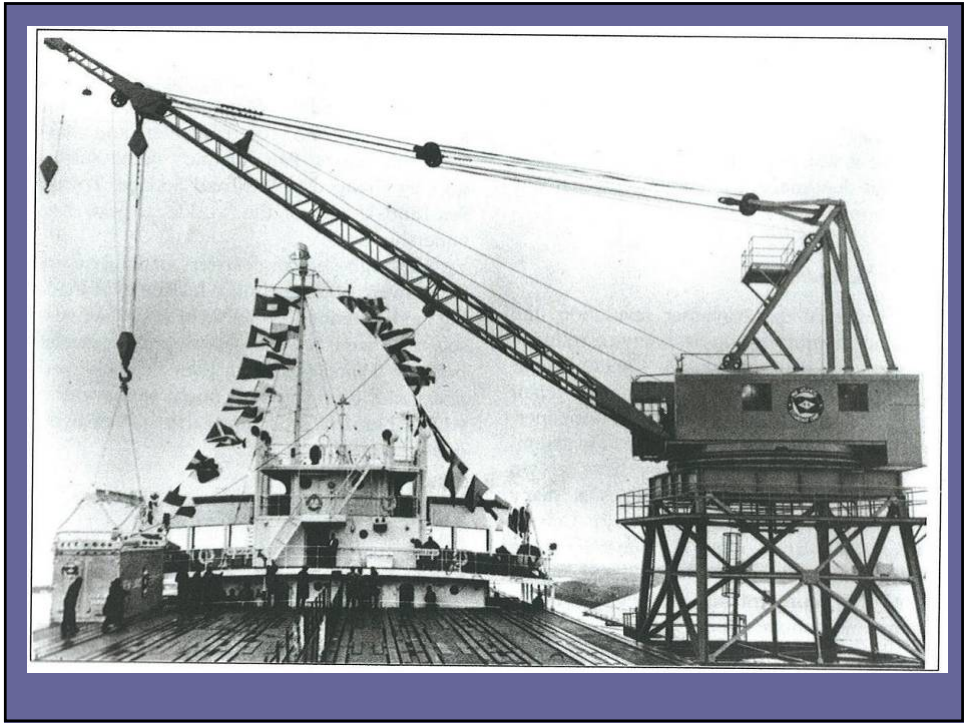
## **TxDOT Project 0-5068**

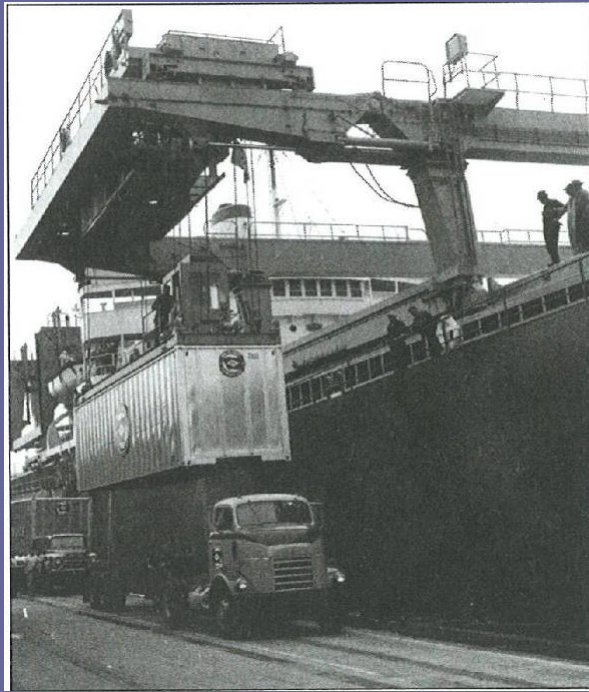
**Robert Harrison  
Center for Transportation Research  
February 3, 2007**

### **Project Scope**

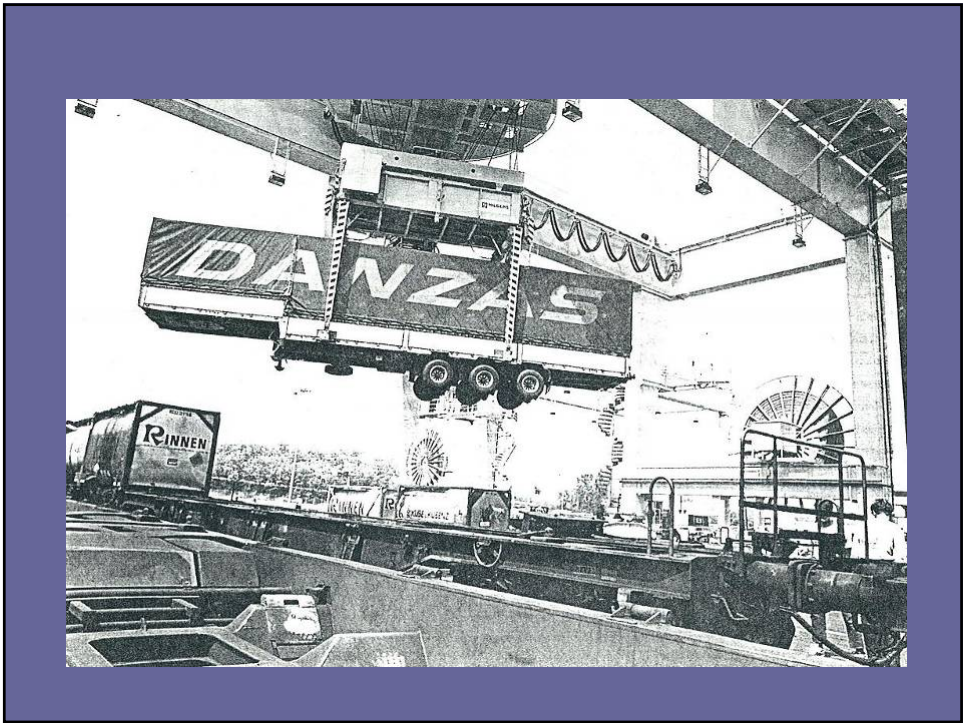
- **Analyze current state of container handling practices in Texas**
- **Predict growth in future container volumes**
- **Isolate strategies to better manage growth**
- **Predict impact on port and landside infrastructure**

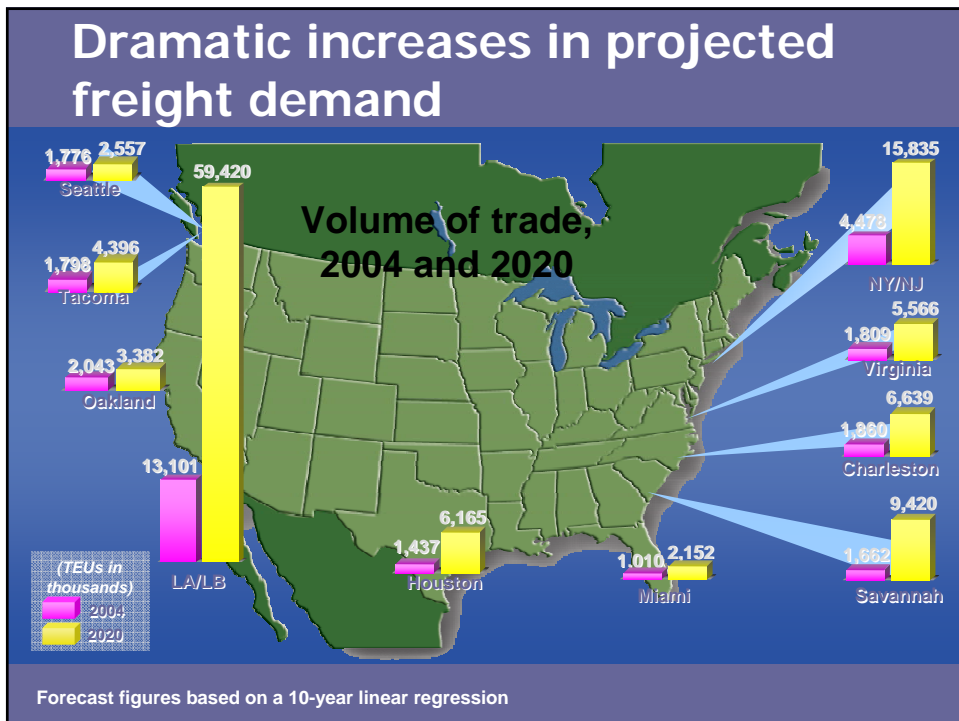








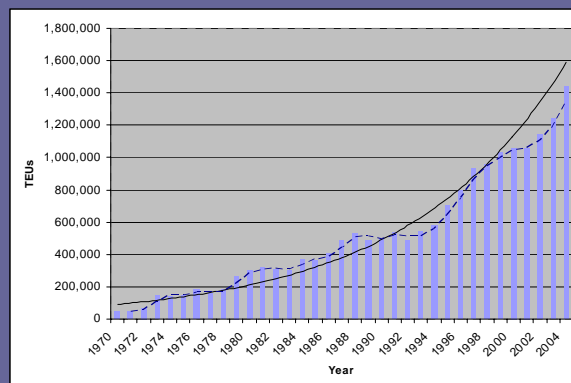




## Background for Container Growth Estimates

- Status of the global shipping market
- Trends in port and ship capacity
  - 10,000 TEU vessels will be delivered in 2007
  - Rapid expansion of Port Capacity in China.
  - India attempting to overcome infrastructure deficit
- Improvements in ship and port technologies are coupled with new processes that could help to manage growth
  - Crane double cycling
  - Automation

## Container Growth at the Port of Houston

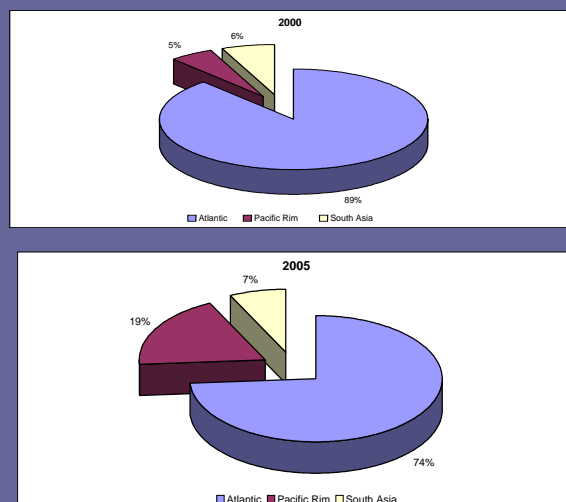


Each bar represents the total annual TEUs handled. The dotted line is the moving average while the solid line is an exponential trend line.

## Port of Houston compared to selected large container ports (2005)

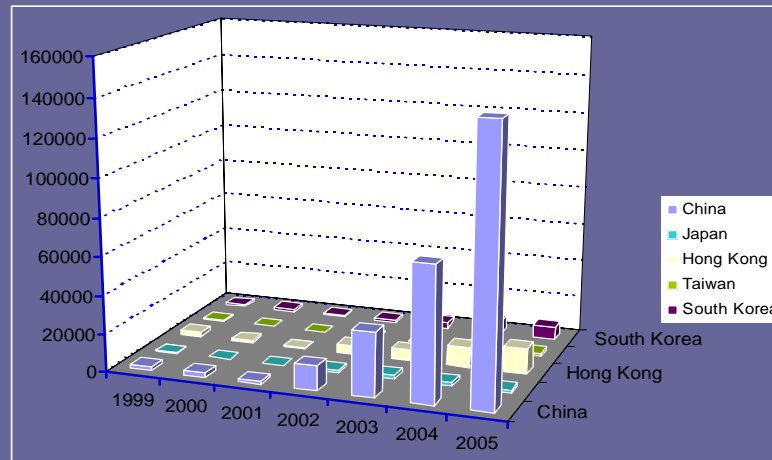
- Port of Long Beach: 6,709,818
- Port of New York and New Jersey: 4,792,922
- Port of Seattle: 2,087,929
- Port of Houston: 1,584,100

Asian trade has increased to nearly a fifth of all container trade at POH - in only three years





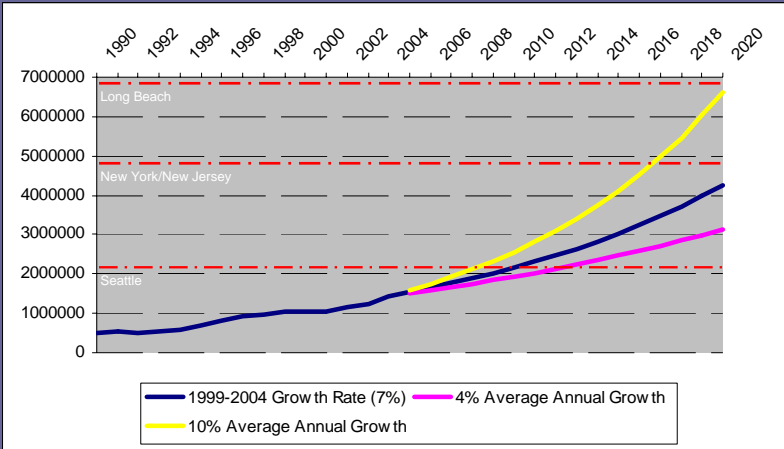
## Chinese trade has exploded - and dwarfs that of other Asian nations at Port of Houston



## Chinese trade now accounts for a large - and increasing - proportion of yearly container growth at POH

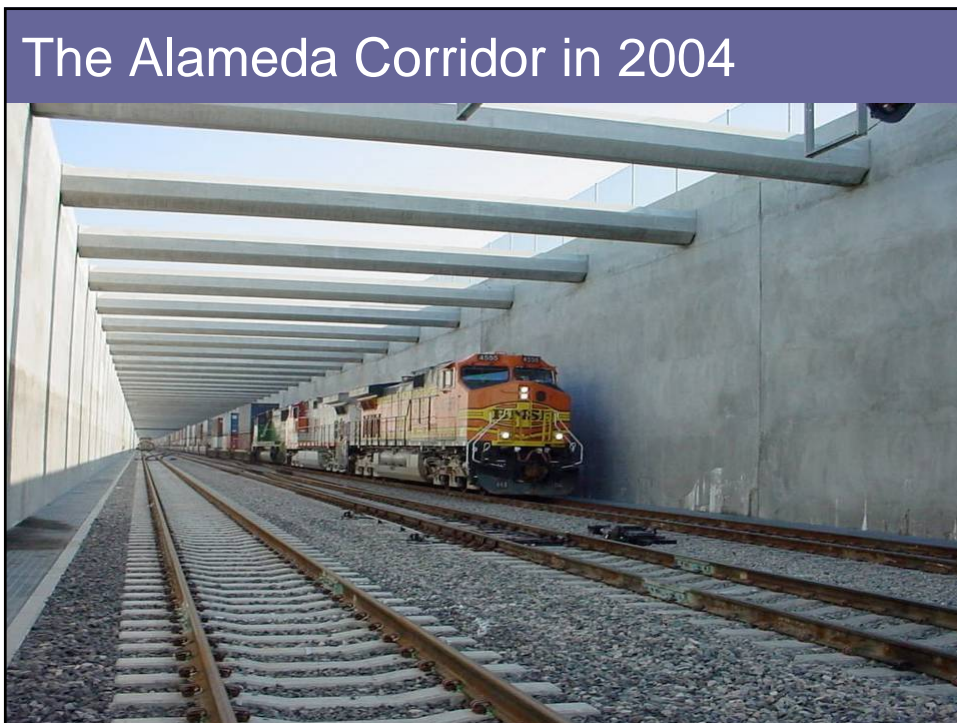


If current trends continue, the POH will grow to the current size of today's largest ports



The I-710 Freeway in 2004





## **The Port Terminal Railroad Association (PTRA) Systems**

- **Initial Findings**
- **Options to Improve Conditions**
- **Draft Recommendations and Costs**

## **Study Focus**

- **Internal Rail Port Services and Market Demand**
- **Access problems to and from the port's main door that inhibit port have negative impact on internal port railway efficiency**
- **Internal port railway capacity problems**

## Initial Findings

- Pasadena to Harrisburg & Manchester Jct single track restricts train movements
- Barbours Cut approach and yard already at capacity
- Single track access to the north restricted between port access door and Englewood Yard
- Track at capacity to the west and NW via Rosenberg
  - Impacts directly on Barbours Cut biggest customer
- Track at capacity to the south via BNSF & Hobby airport area

## Options to Improve Conditions

- Recommendations consistent with last year's report
- Train delay is the major cost
  - Also the major railway benefit if fixed
- Train caused delays to highway commerce and the traveling public from restricted railway port approach with long slow moving trains is also the major public cost
  - Also the major public benefit if fixed
- A few rail passing siding additions and some limited double track will bring the benefits (and railway operating savings)



## Cost Estimates

### Total Under \$50 Million

- \$15 to \$20 Million for port approach sidings
- \$10 to \$15 million for Englewood double track
- Balance for the doublestack and Pasadena doublestack improvements
  - No estimate yet for Strang branch container port access

## Road Corridor Connections to POHA

- Truck container movements from the POHA depend on several key road corridors including Barbours Cut Blvd, SH 146, SH 225 and 610 in order to access local distribution centers and rail yards.
- Report addresses planned improvements in each of these corridors.

## Improvements to SH 146

- Links Barbours Cut to SH 225 will become even more important once Bayport opens
- Current major investment study calls for capacity expansions to meet expected growth of between 60% to 100% through 2022
- Would provide 6 general purpose freeway lanes with frontage roads for the segment of the corridor linking red bluff road to Fairmont parkway
- Construction is expected to begin in 2010 with full buildout by 2020

## Improvements to SH 225

- Primary corridor for trucks transporting containers from Barbours Cut
- Most sections of the roadway are still significantly under capacity
- Plans call for no significant expansion of the mainlanes through the study horizon
- TxDOT plans on eliminating the left hand exit bottleneck that causes congestion where 225 meets 610
- TxDOT considered but rejected for the time being options such as no build, truck only toll lanes, HOV, and commuter rail

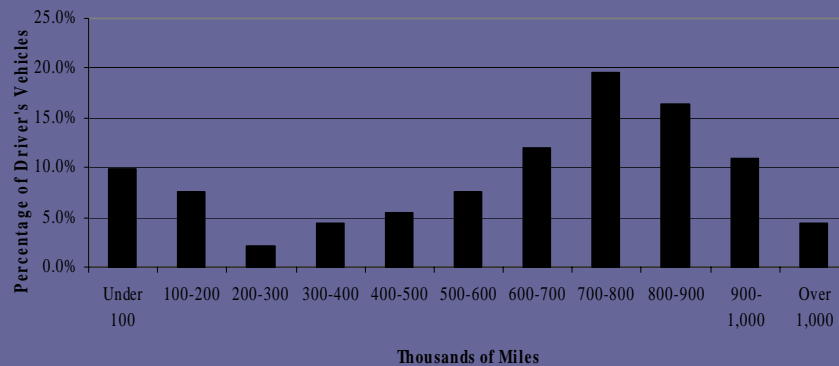
## Examination of Drayage at POHA

- To Houstonians, container growth at the port will be manifested in the form of more trucks on the roadways
- Important to learn more about delay patterns and routes chosen by drivers
- Need for more information on drayage fleet
- Port does not keep detailed information about truck operations outside port gates

## Survey Results

- On average, drivers work 55 hours per week
- Average dray length is 46 miles
- Average number of trips to the port per day is 3.2
- 75% own their own truck
- Almost 90% belong to a trucking company
- Drive on average 60,000 miles per year
- Substantial variation truck mileage profile with largest cluster between 600-900 thousand miles.

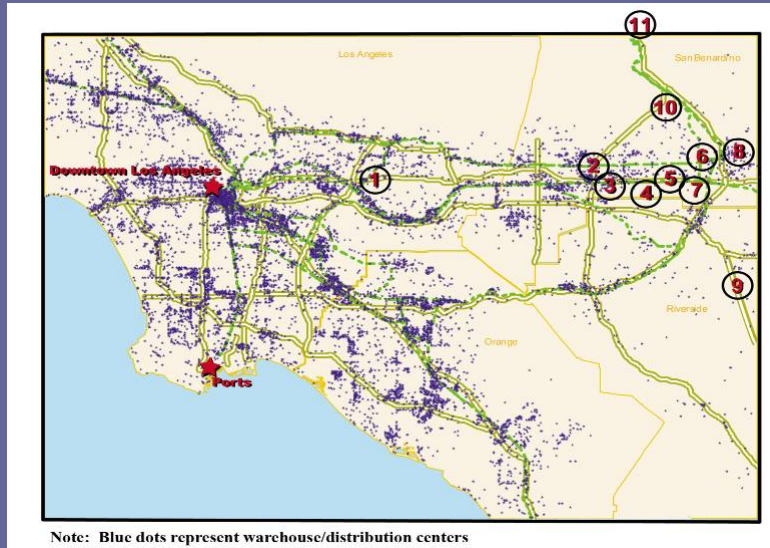
## Houston Dray Fleet Age Profile



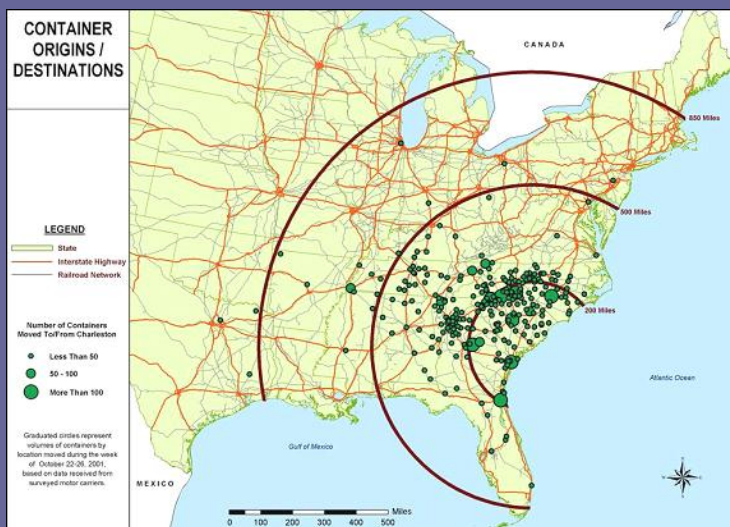
## Houston Distribution Centers

- Distribution centers in Houston classified as small-box (under 100,000 sq ft), mid-box (100,000-400,000) big-box 400,000 - 1,000,000, Mega-Box over 1 M.
- Often used to consolidate freight that can be part of transnational shipments
- Can be strictly for distribution, a combination of distribution center/warehouse, or a container freight station

## Locations of Warehousing/Distribution Centers & Existing & Potential Intermodal Rail/Terminals in the Inland Empire



## Meeting the Transportation Challenges of the 21st Century: Intermodal Opportunities in the Appalachian Region Case Study Exhibit 4.2: Port of Charleston Container Traffic (Origin and Destination Concentrations)





Meeting the Transportation Challenges of the 21st Century: Intermodal Opportunities in the Appalachian Region Case Study  
Exhibit 4.3: Map of Potential SCIP Generalized Locations



## DC's in the Houston Area

- Import distribution centers in the Port of Houston area are predominantly privately owned facilities and are operated by a third party logistics provider.
- Many are located near the city center
- Location decisions for new DC's based on road and rail access, land value and productivity.
- Some smaller container freight stations generate comparatively high numbers of truck trips and VMT
  - Examples: 200,000 sq ft CFS produces 4 million annual VMT in the Houston area

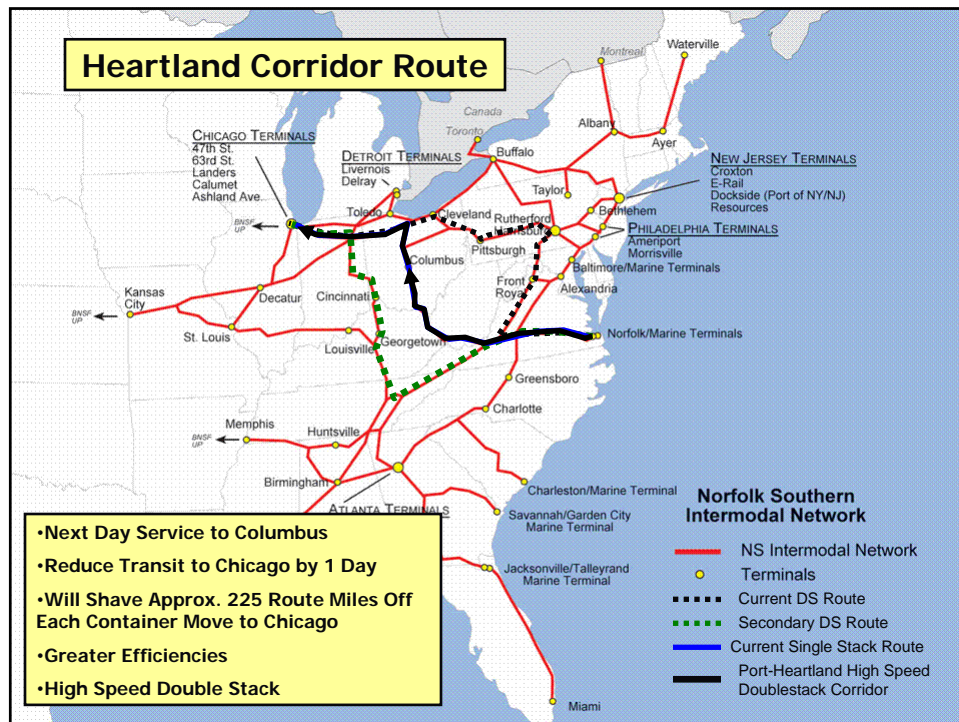
# Logistics Park-Alliance



## APM Norfolk Terminal

- 95% of all trucks will be serviced within 11 minutes





## Conclusions Container Growth

- In the next two decades, Texas should expect to see robust growth in maritime containers
- This trend is driven by economic and population growth, the growth of maritime trading partners, and technological advances in intermodalism
- Despite significant challenges ahead, it appears that Texas will have adequate capacity to handle this growth and will have an advantage over competing regions

## **Conclusions**

### **Rail issues**

- Rail efficiency remains a weak link with several problems specific to the region
- Proposed system of grade separations would significantly improve Houston system velocity and would broaden the customer base for rail intermodal shipments leaving Houston.
- Improvements to Houston rail network and PTRC are being driven primarily by non-containerized commodities.

## **Conclusions**

### **Road Corridors**

- Successful rehabilitation of Barbours Cut Blvd is critical and will require careful planning to avoid construction related bottlenecks
- SH 146 master plan should be periodically re-evaluated based on container growth Barbours Cut, Bayport and Texas City
- SH 225 improvements should be sufficient for handling expected growth rates

## **Conclusions Dray and Distribution Center Network**

- Improving dray operations a key strategy for improving overall port efficiency
- Understanding the function of distribution centers is key to projecting impacts of containers on the road network.



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