



West Coast Barge Operations

Mark Sisson, PE
JWD Group

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JWD Group

- Founded 1964
- Involved in container handling since design of the first container crane
- Introduced new concepts to marine terminal planning and facilities design
- Since 1985, used simulation as planning tool to test alternative layouts, marine and rail terminal performance, operating systems and equipment



Types of Projects

- Greenfield site planning
- Brownfield site planning
- Port-wide master planning
- Operations analysis
- Capacity analysis
- Labor and technology implementation
- Architecture
- Graphics
- Consulting for industry legislation
- Port security operations



Overview

- Survey of West Coast Operations
- Study of the Potential for Bay Area Use
- Comparison of West Coast terminal operations with and without barge transshipment



Why use barges?

- No choice – Hawaii
- Good river access to hinterland – Portland, Oakland?
- Political motivation to reduce truck trips – Northern Europe, US?



What are West Coast Operators Doing?

- Portland
 - Lo-lo operation
 - Un-powered barges without cranes
 - Mobile harbor cranes at feeder ports
- Honolulu (Matson)
 - Lo-lo operation
 - Un-powered barges with cranes
 - No dock cranes at feeder ports

Port of Portland Terminal 5



Barges and deep-sea vessels are worked on the same wharf with the same cranes

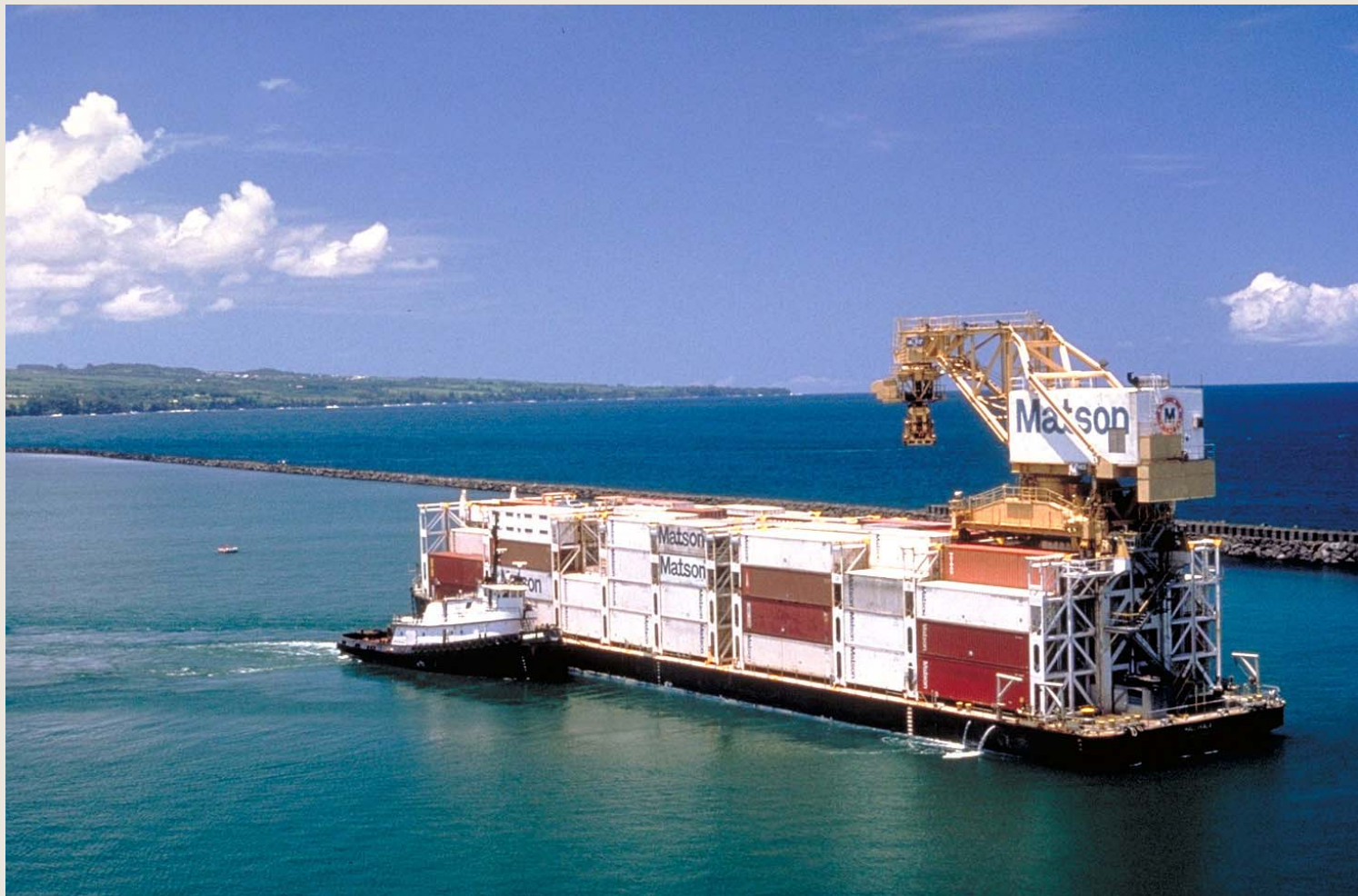


Barges in Portland





Matson Barge for Hawaii Service



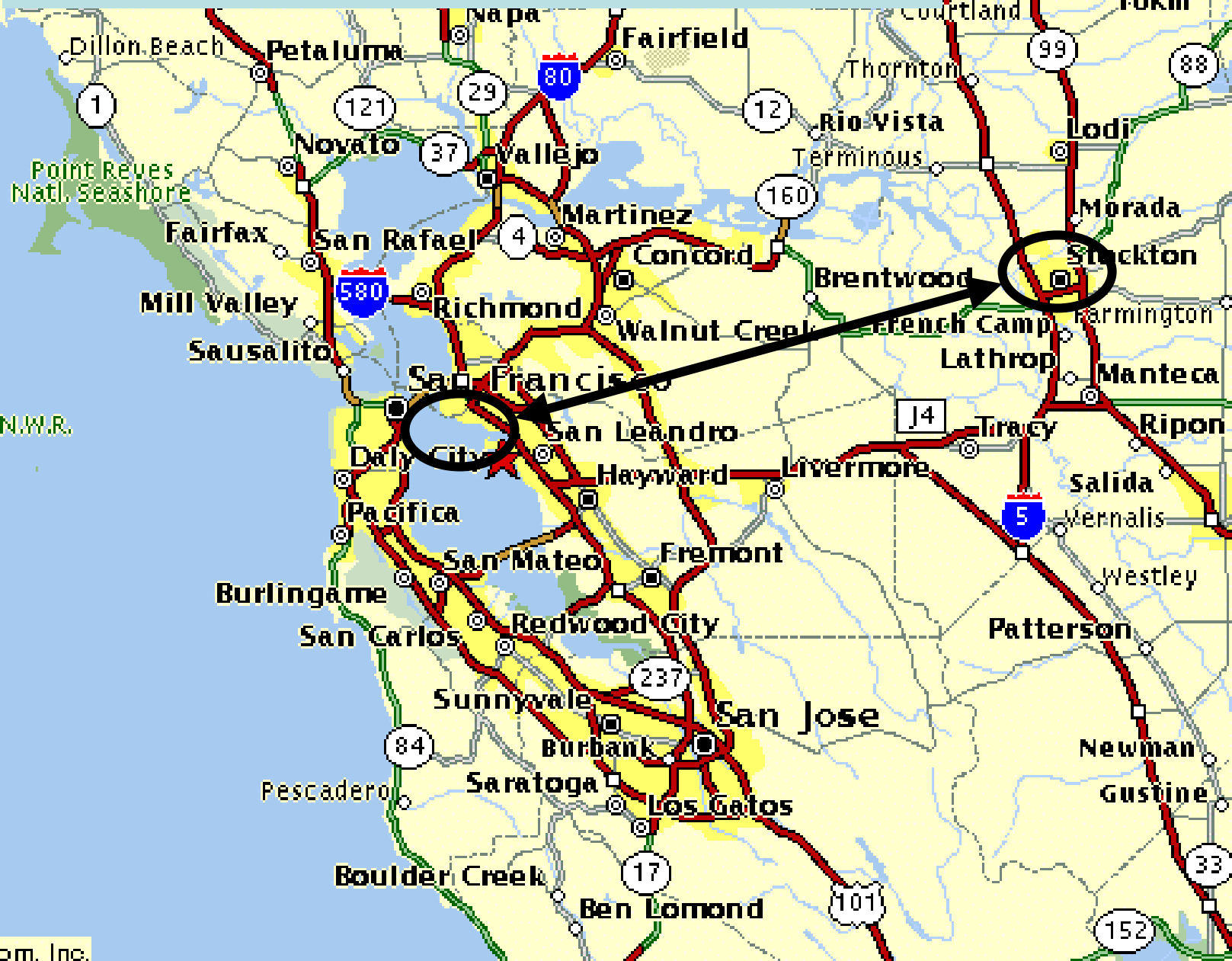


Opportunities in Oakland

Oakland – Central Valley Area

MAPQUEST™
Bodega Bay

Farallon N.W.R.





Northern CA Freight Transportation Issues

- California has declared the end of new freeway development
- No easy way to expand rail infrastructure - no Alameda Corridor is possible
- Container throughput growing at 4% per year for the foreseeable future - 50% growth within 10 years
- Growth is driven by Northern California economy
- Other traffic demands are also growing
- Freight traffic has no political constituency
- P/Oak has very limited expansion potential beyond current boundaries – road capacity may be a long term constraint
- Ports of Stockton and Sacramento have a great deal of expansion capability



Advantages of Water Transport

- Clean
- Safe
- Efficient
- Cheap if volume is high enough
- More than 90% of world freight traffic is on water,
for good reason



Why Barges?

- Reduce storage dwell times and increase storage density in Oakland, improve total **port capacity** without expansion
- Reduce truck moves on Bay Area roadways, make them **safer, cleaner, more efficient**
- Reduce truck emissions in the Port area, improve **quality of life** for neighbors
- Reduce rail traffic in the Port area, **reduce conflicts** at grade crossings with other uses



Perceived Obstacles to Barge Transshipment

- Prohibitively expensive extra terminal labor cost
- Port fees based on vessel lifts
- Delay in transport
- Complex logistics
- Institutional complexity
- Loss of cargo control
- Inertia



Current Oakland Terminal Operations

- Imports preferably stored on wheels
 - Low labor cost but inefficient use of valuable land
- Imports grounded served by RTGs if needed
 - Good use of land but expensive and slow for trucker service

Wheeled Storage



RTG Storage



Another View of RTG Operations





With Barge Transshipment

- Imports via barge stored in top-pick blocks at even higher density than RTGs
- Imports move off the terminal with the next barge – lower dwell time
- Imports stored on wheels in Stockton or Sacramento where land is 25% of the cost at Oakland
- Exports and empties potentially delivered to Oakland closer to deep-sea vessel departure time (lower dwell time)



Barge transshipment could be stored at this density

Instead of this

Hanjin Terminal





Why won't barge transshipment result in much extra terminal labor cost?

- No IBCs or lashing required - Columbia River terminals use five person ILWU gangs compared to 20 for deep-sea service
- Imports via barge can be retrieved from a CY stack with top-picks (half the crew size of RTGs, half the machine cost of RTGs)
- No rehandling required: 25-30 net moves per hour for top-picks vs 8-10 net moves per hour for RTGs
- Very simple wheeled operation at feeder ports

Lashing a Deep-sea Vessel





Note the Lack of Lashing and IBCs in Portland, OR Barge Operations



Note cell guides to allow four-high stacks without lashing or IBCs



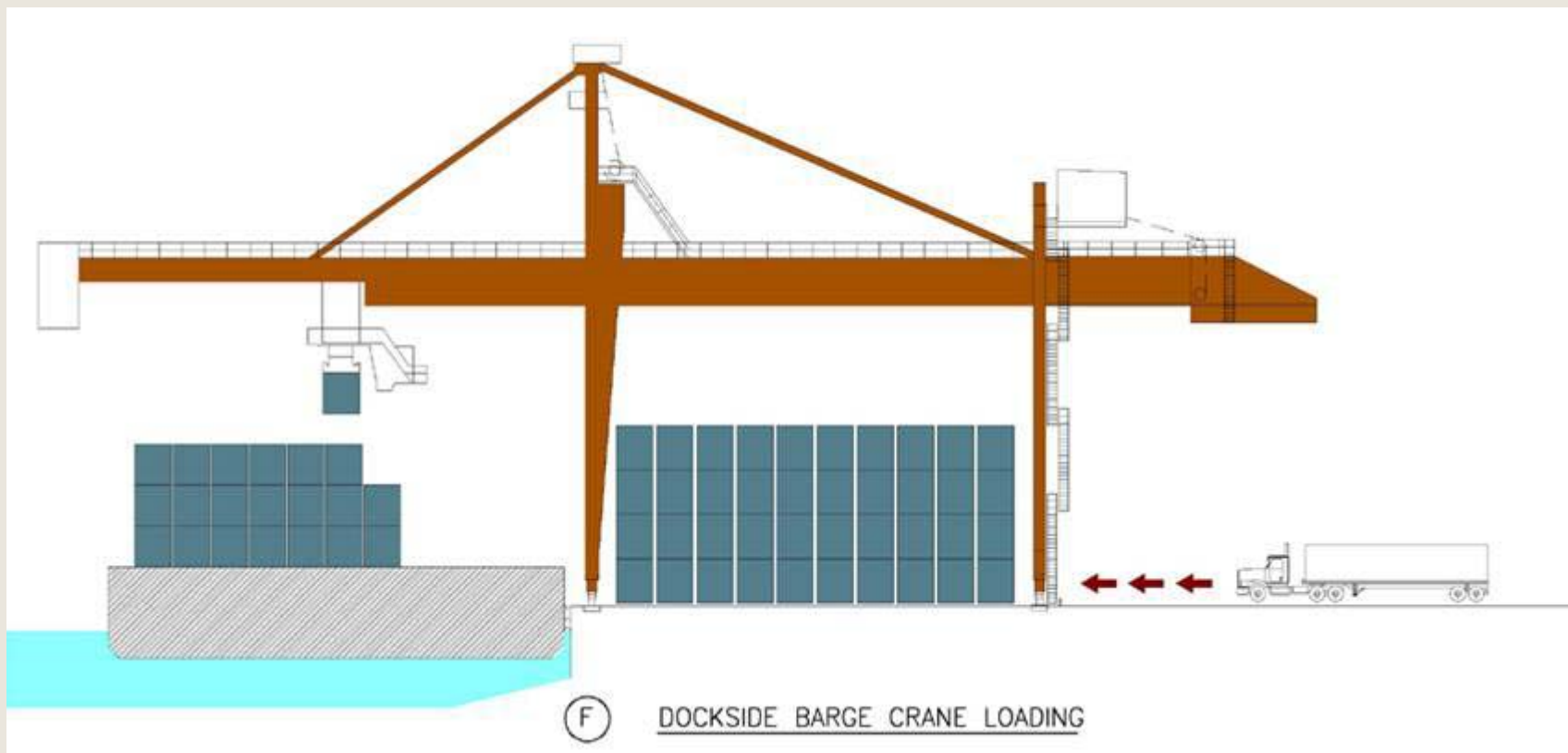


Feeder Ports

- Can use much smaller, cheaper cranes for barge service than what is needed at deep-sea terminals
- Greatly reduced dredge depth required (10-15')
- With wheeled operations, very little yard equipment is required
 - Side picks for empty stacking
 - Top-picks for chassis flipping
 - Terminal tractors for stevedoring (or not)



LO/LO Wharf Gantry Crane



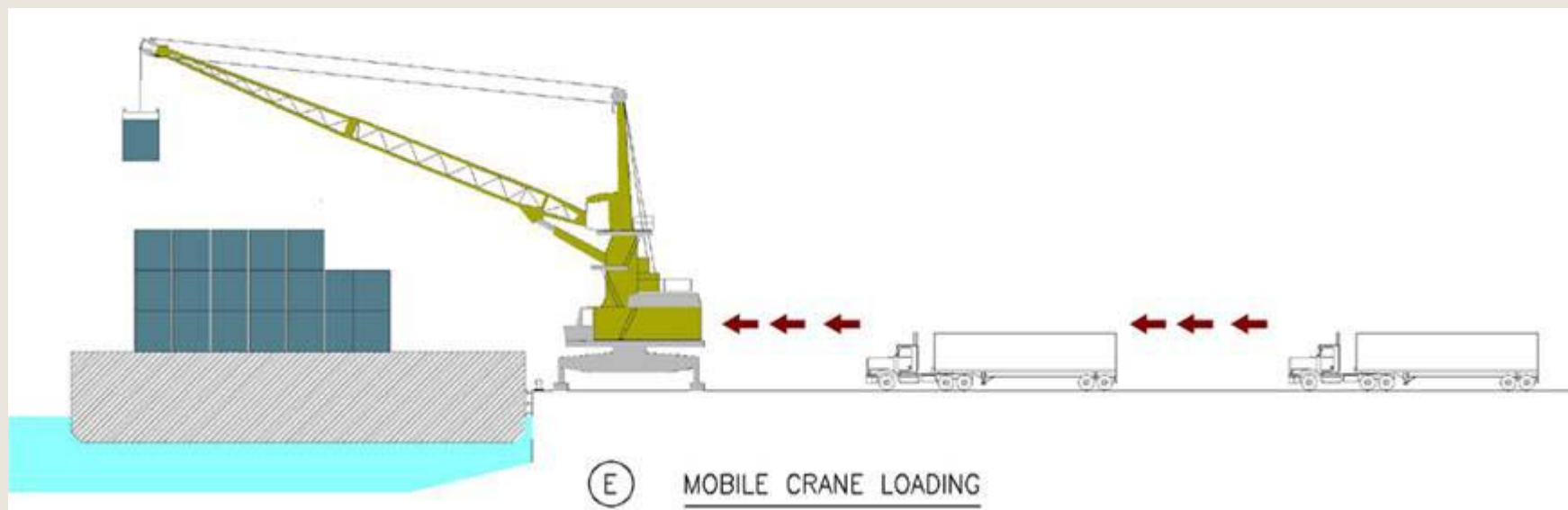


Rhine River, Germany





LO/LO Mobile Harbor Crane





Columbia River Umatilla, Oregon





Columbia River Pasco, Washington





Institutional Complexity

- The Ports of Oakland and Stockton are “landlord” ports - not “operating” ports
- Barge terminals in Oakland would probably serve multiple port tenants
 - Competition vs cooperation between lines
 - Cargo sensitivity to delay
- Labor structure/gang size uncertain:
 - Lack of local precedents
- Ports would need to charge barges like trucks, not deep-sea vessels, for use of wharf



Logistical Advantages

- Consolidation and potential for better load balancing than with individual truck moves
- Location in areas with less traffic congestion and more predictable truck travel time
- Potential for overweight all-water moves to some destinations
- If distribution centers are co-located at feeder ports, overall truck trips can be further reduced



Issues for further study

- Market potential
 - Geography
 - Sensitivity to dwell time
- Required service and economies of scale
 - Frequency of service
 - Shared vs common facilities
- Social benefits (or cost of do-nothing)
 - Congestion
 - Air pollution
 - Safety
 - Increase in Port Capacity

Thank You





Speaker Contact Info

- Mark Sisson, P.E.
- JWD Group
- 300 Lakeside Drive, 14th Floor
- Oakland, CA 94612
- Tel: (510) 832-5466; Fax: (510) 835-3464
- msisson@jwdgroup.com
- website: www.jwdgroup.com