Low Profile Cranes
New Applications

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Good morning.

Low profile cranes were first created in the late 1960's.

Low profile cranes cost about 15% more than A frame cranes and were used because they had the advantage of keeping the cranes profile below aircraft clearance lines.

This is one of the Port Everglades cranes with 100’ gage and 16-wide containers outreach.

Worldwide Low Profile Cranes

Number of Cranes	Approximately 40
Locations	Boston, Everglades, Oakland, Elizabeth – New Jersey Sand Island, Hawaii, Miami Italy
Years Built	1970 to 1999
Size	13 – 16 wide vessels
Overall Height	Maximum151 feet

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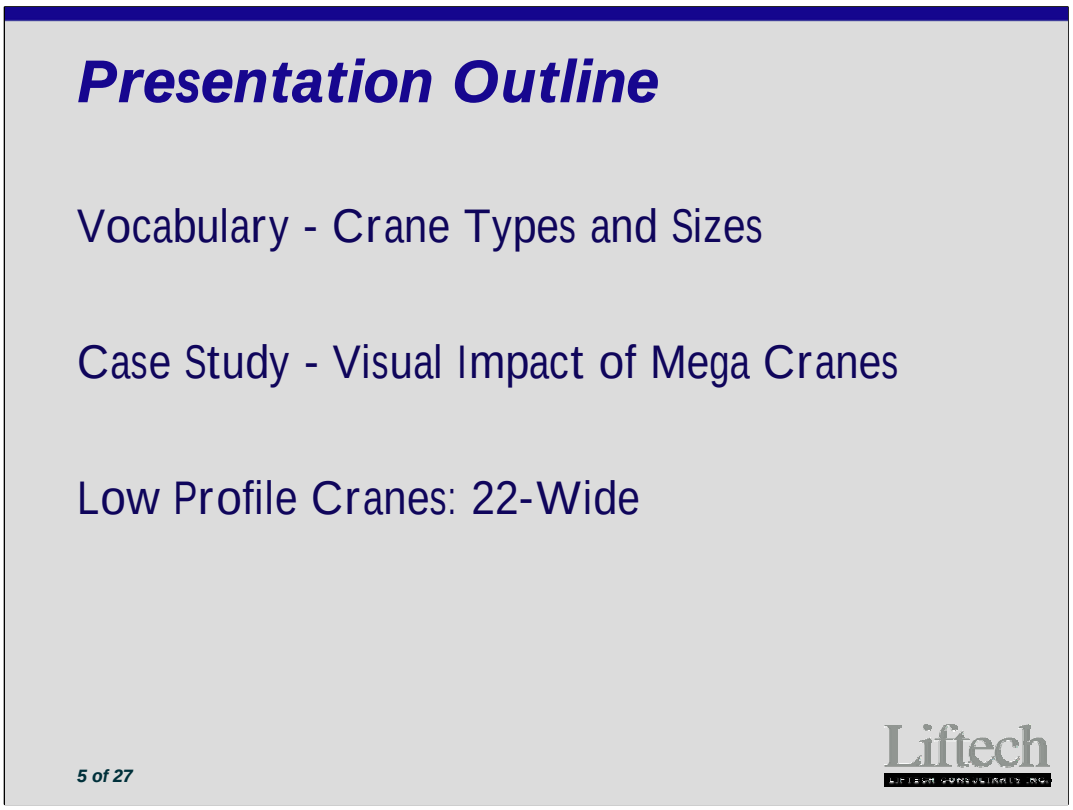
There are relatively few low profile cranes. Since they cost more and weigh more, low profile cranes have only been used where they are required.

The ubiquitous A frame cranes, being less expensive, soon dominated the container port's skyline.

A few cranes are attractive; too many change the view of the city and the sea. To some, the new view is unattractive.



In Los Angeles, the public has objected to the new skyline. In response to the public's concerns, the port is considering using low profile cranes to reduce the visual impact on the skyline.

This raises two questions:

Do low profile cranes improve the view?
If so, is the improvement worth the cost?

As we talk, the Port of Los Angeles is considering the answers to these questions, and we will not be able to answer these questions today.

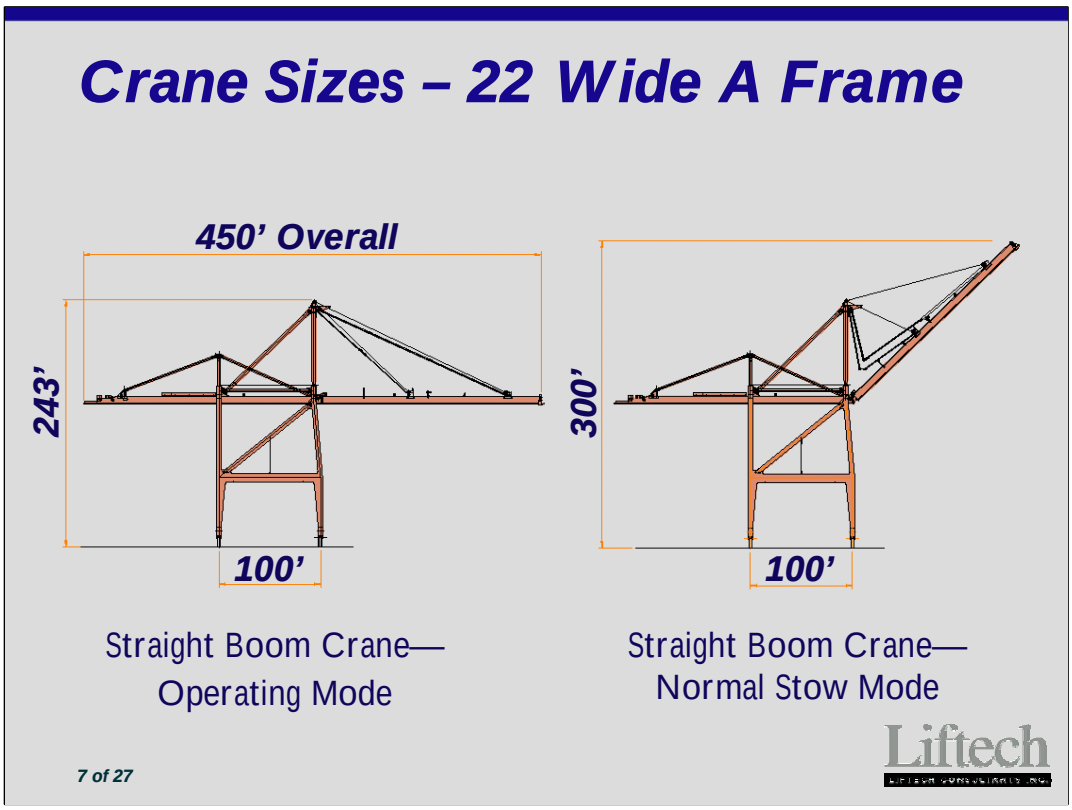
We will, however, develop a vocabulary and examine some crane types and sizes.

We will look at the visual impact study for the Port of Los Angeles, and, finally, look at a proposed 22-wide low profile crane.

The visual impact is due to, not only the number of cranes, but the size.
On the lower left is a correctly scaled analog photo the 1958 Matson crane, the world's first dockside container crane.

On the right, to the same scale are the new Port of Oakland mega cranes.

Need I say more about the increased visual impact of the new mega cranes?

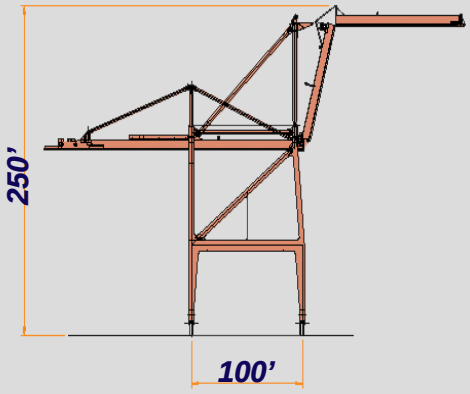


The standard A-frame crane.

The trolley runway is 450’ long, more than a city block.

The cranes are so large the boom does not need to be fully raised to clear the largest ships, and is only fully raised for maintenance.

Articulated Boom –18 Wide



Articulated Boom Crane—
Normal Stow and Maintenance Mode

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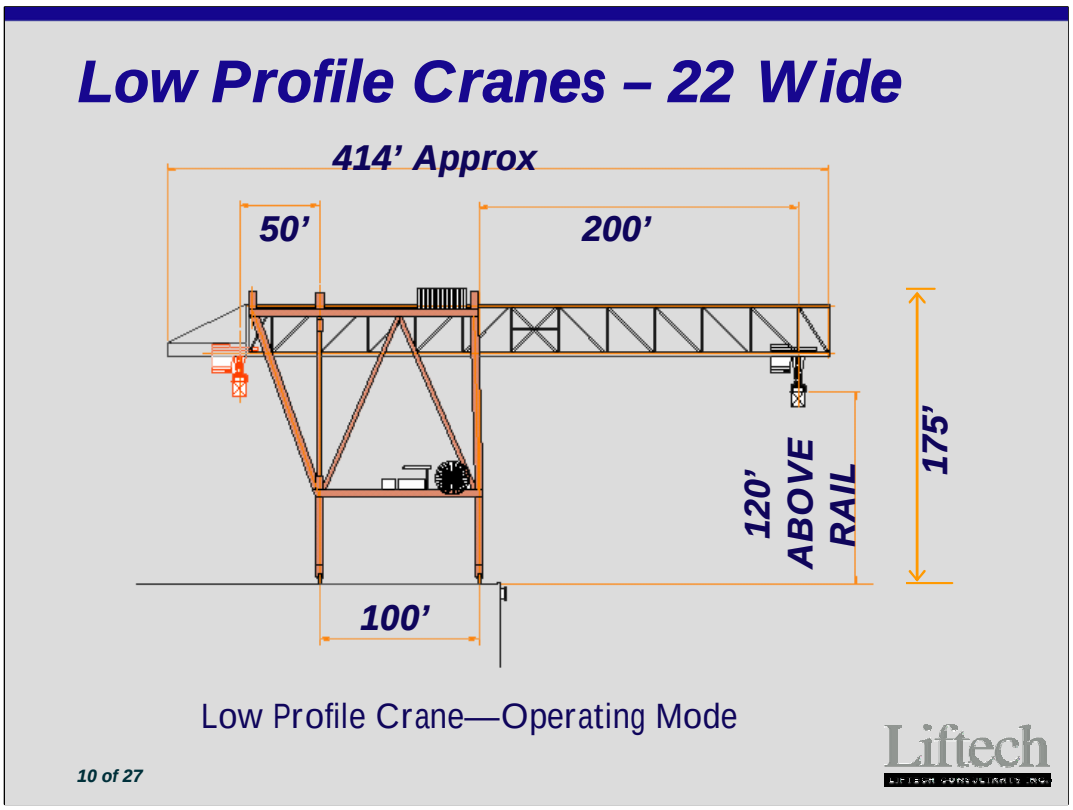
The articulated boom crane.

The boom is hinged to reduce to overall height. These cranes cost more than the standard A-frame but less than the low profile crane.

18-Wide Articulated Boom

This is the articulated boom crane.



The low profile crane.

This is one of Liftech's concepts for a 22-wide crane. The boom is 30' deep. The crane weighs 1800 tons including several hundred tons of ballast.

16-Wide Low Profile

The Everglade's cranes are more modest, but, I think, still impressive.

These cranes negotiate a 90° corner. The boom is midway between the operating and stowed positions to balance the wheel loads on the corner.

Visual Impact Case Study

Courtesy- Jones and Stokes

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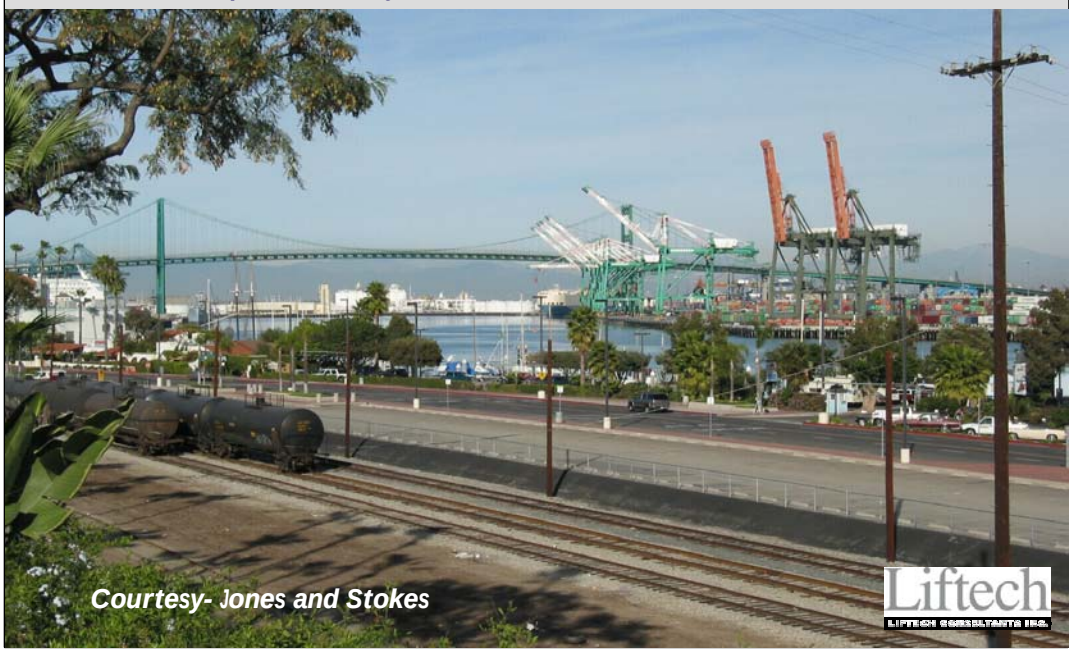
Now that we have the vocabulary, we will look at what is happening at the Port of Los Angeles.

Existing Condition--South

Visual Impact Study

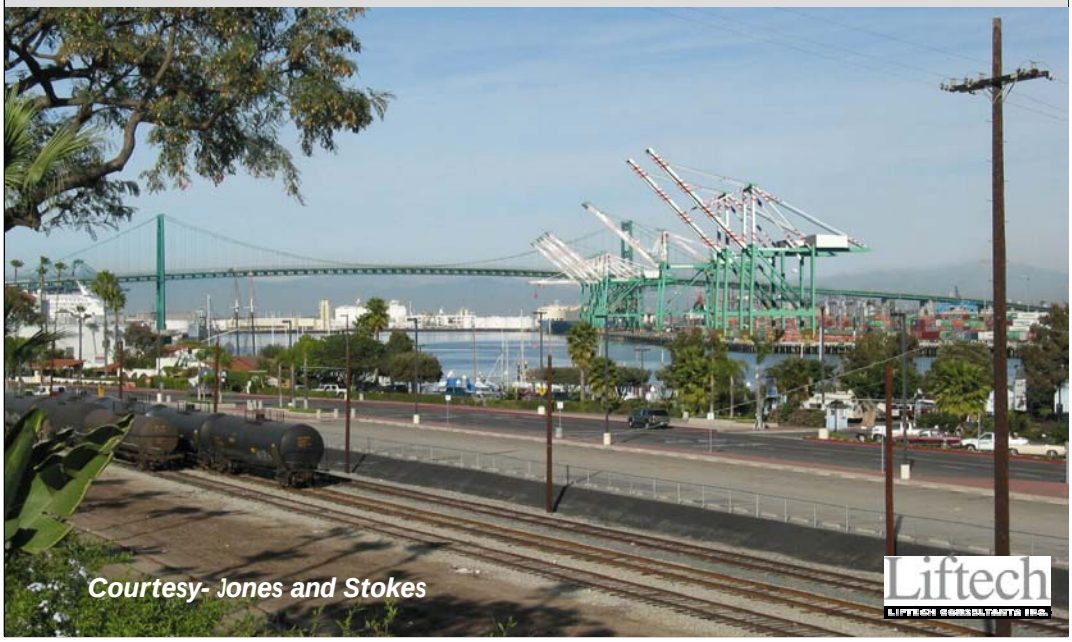


This is the Evergreen terminal viewed today from San Pedro. Although these post-Panamax cranes are not a large as the new cranes that soon arrive, they impact the view.

Existing Condition--South

South View with New A-Frame Cranes

Visual Impact Study



This is an artificial photo showing the view once the new Evergreen mega cranes arrive.

The impact is greater, but the bridge and channel views are not obstructed.

This slide compares the new A-frame cranes to the existing cranes.

The image of the new A-frames is an artificial photo showing the view once the new Evergreen mega cranes arrive.

The impact is greater, but the bridge and channel views are not obstructed.

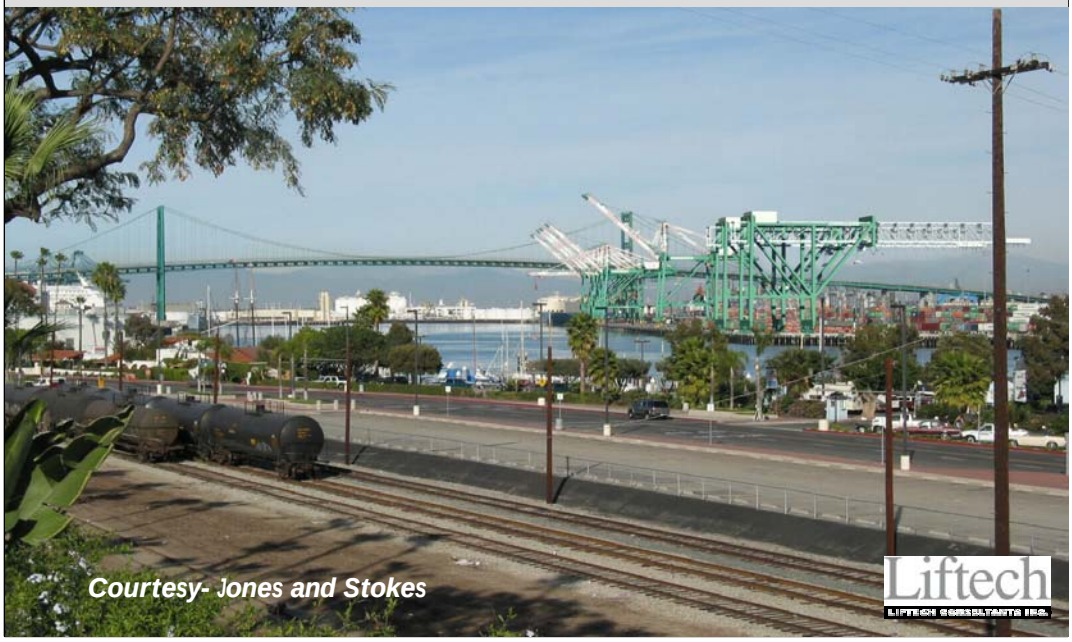
South View with Low Profile Cranes Operating

Visual Impact Study

This is an artificial photo showing low profile cranes with the shuttle boom extended over the water.

South View with Low Profile Cranes Stowed

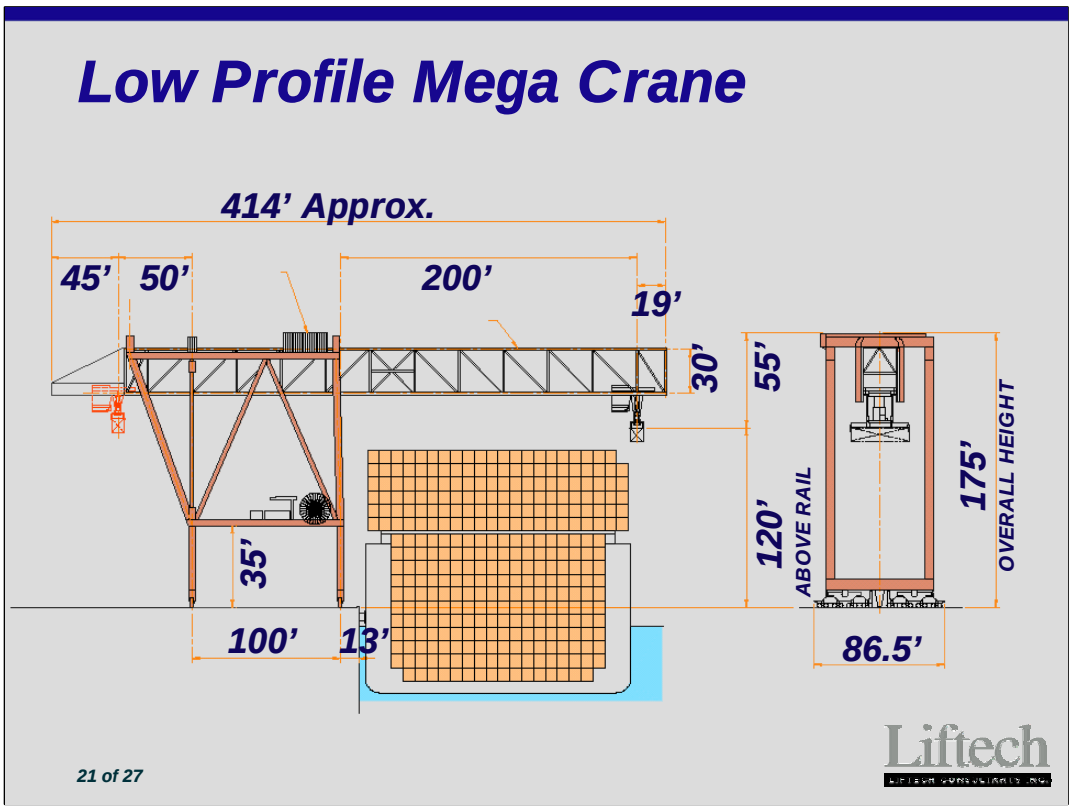
Visual Impact Study



The same cranes with the boom retracted.

This slide compares the new low profile cranes to the existing cranes.

This slide compares the new A-frame cranes to the new low profile cranes.



Now let's look at a low-profile mega crane.

16-Wide Low Profile

The Everglade's cranes are more modest, but, I think, still impressive.

These cranes negotiate a 90° corner. The boom is midway between the operating and stowed positions to balance the wheel loads on the corner.

Wheel Loads—Factored

Low Profile Cranes	Load Combination		
	Operating Condition		Stowed
	Non-EQ	EQ Condition*	Storm Wind*
Landside	90 (60)	140 (95)	110 (75)
Waterside	80 (55)	110 (75)	N. A.

Factored Loads in kips/ft. Service loads are in ( ).

*California

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These factored wheel loads are calculated according the latest ASCE 7 manual. The new manual now clearly defines the dead weight of cranes as dead load.

Wheel Load Comparison (22-Wide)

Total Weight	A-Frame		Low Profile	
	3,200 kips		3,600 kips	
Operating Wheel Loads	Landside	Waterside	Landside	Waterside
Factored (kips/ft)	55	58	90	80
Service (kips/ft)	35	40	60	55

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Just how much heavier are the wheel loads?

About 30 to 35%.

Crane Purchase Costs (22-Wide)

A-Frame Cranes	$6,000,000 to $6,500,000
Articulated Boom Cranes	$6,250,000 to $6,750,000
Low Profile Cranes	$7,500,000 to $8,500,000 (25% premium)

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What about cost?

The cranes cost more to buy and the wharves cost more to construct.
The maintenance costs are not significantly different for low profile cranes.

Based on recent proposals, the cranes cost about 25 to 30% more than standard A-frame cranes.

The questions remain.

Do low profile cranes improve the view?

If so, is the improvement worth the cost?

Interesting questions, but we don’t have the answers yet.

Thank You !

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