Logistics & Intermodal Nodes

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The Inventor of “Logistics” Word

L’art de la guerre se divise en cinq branches purement militaires; la stratégie, la grande tactique, la logistique, l’art de l’ingénieur, et la tactique de détail.

Antoine Henri Jomini, Precis de l'Art de Guerre

1836 AC

Exporting “Logistics” in New World

…Between Strategy and Grand Tactics comes logically Logistics. Strategy decides where to act; Logistics is the act of moving armies.

Alfred T. Mahan, Objects of the U.S. Naval War College. An Address
1888 AC

Moving Logistics in Industry

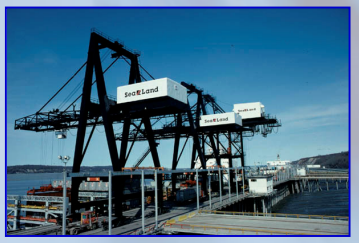
Industry was sensitive to logistics problems since first developments and examples are available everywhere since history is reported.

Engineering Supply: Containers

I don’t have much nostalgia for anything that loses money

Wouldn’t it be great if my trailer could simply be lifted up and placed on the ship without its contents being touched?

Malcom P. McLean, Sea Land Founder (established in 1955 with 6MUSD, formerly 1700 truck company, sold in 1969 for 160MUSD, acquired by Maersk in 1999 for 800MUSD)



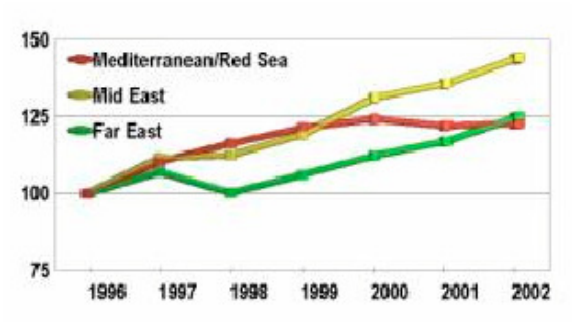
Multimodal Traffic and Italy

Una efficace evoluzione in senso multimodale del sistema nazionale dei trasporti, ove è già stata realizzata, ha comportato benefici di rilievo per la competitività complessiva dell'intero sistema produttivo

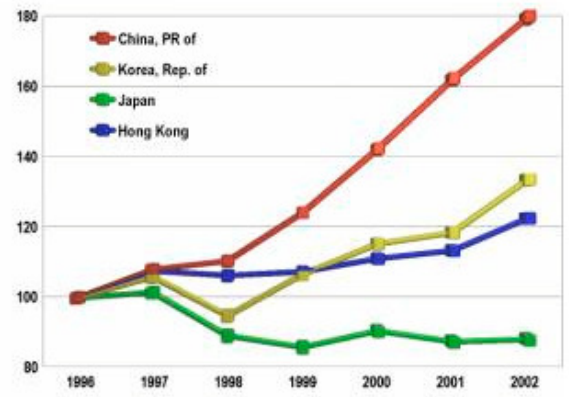
Aldo Grimaldi, President Ship Owner Association (Gruppo Grimaldi 1998, 323 MEuro sales), Economia del Mare e Sviluppo del Paese

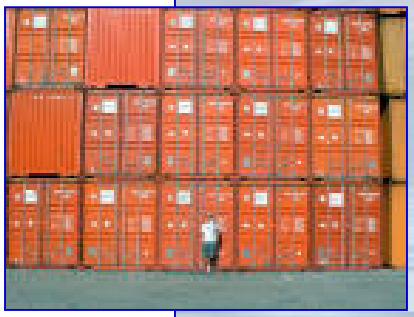
Container Traffic around 2000

Asian ports - cargo traffic of ports according to region 1996–2002 (Index 1996 = 100) [3]

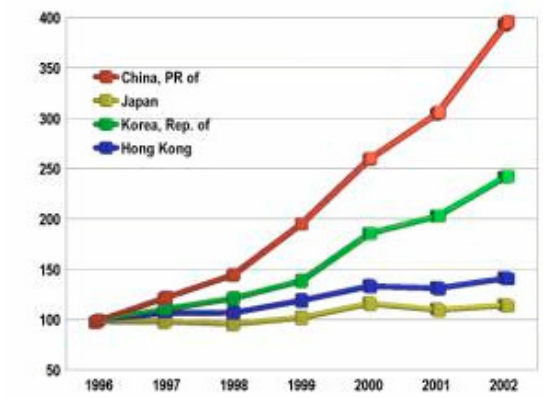


Port traffic of selected Asian countries 1996 – 2002 (Index 1996 = 100) [4]

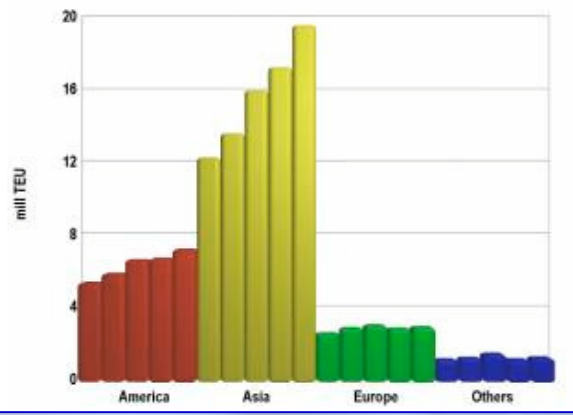




Container traffic of selected Asian countries ports'1996 – 2002 (TEU- index 1996 = 100) [5]

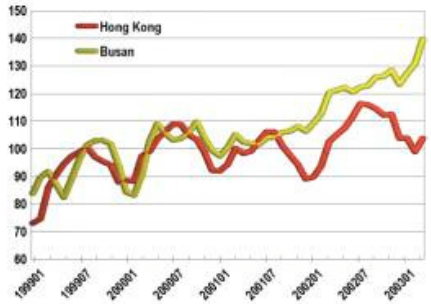


Continental spreading of container traffic of major Far Eastern ports 1998 – 2002 (in mill TEU) [6]

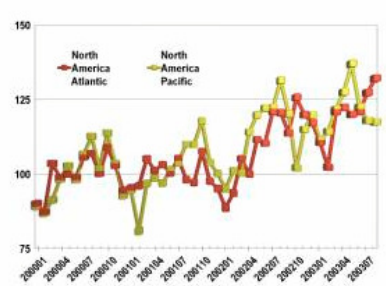


Cargo Traffic Evolution

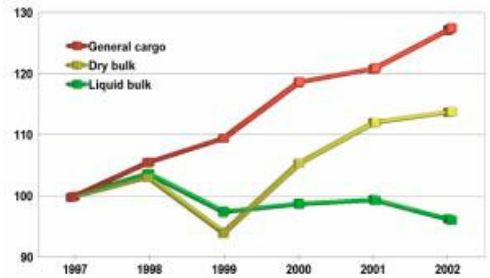
Monthly container traffic of Hong Kong and Busan (Moving quarterly averages of TEU - Index 2000=100)



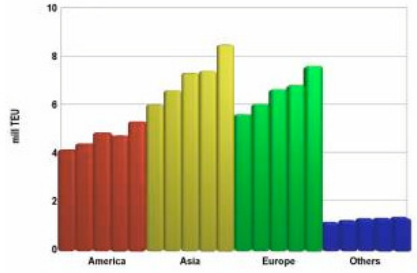
Monthly container traffic of North American ports January 2000 up to August 2003 (TEU-index average 2000 = 100)



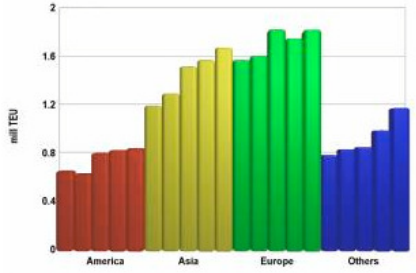
Cargo traffic of European ports by loading categories 1997 - 2002 (Index 1997=100)



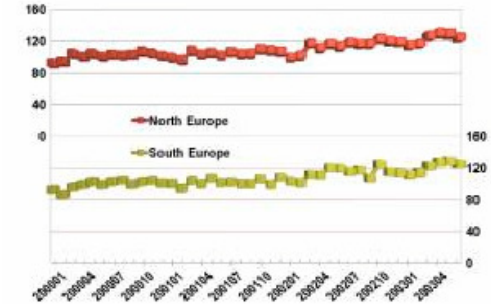
Container traffic of major North range ports according to continent 1998 – 2002



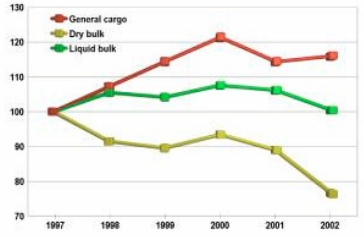
Container traffic of major South European ports according to continent 1998 – 2002



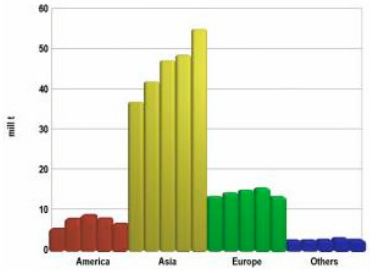
Monthly container figures from January 2000 – June 2003 (TEU-index, average 2000 = 100)



Cargo traffic of North American ports by loading categories 1997-2002 (index 1997=100)

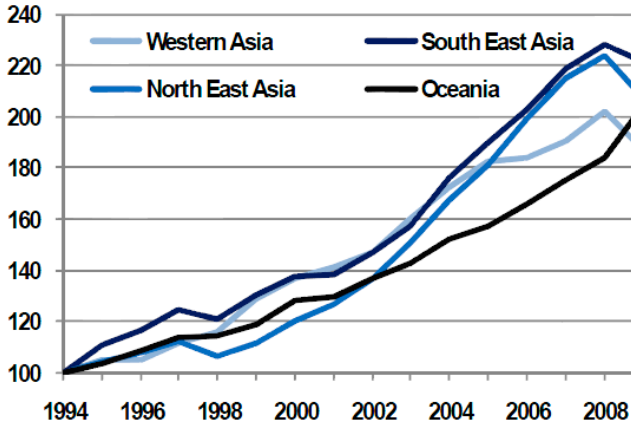


Container traffic spreading of selected North American ports according to continents 1998 - 2002



Container Traffic in 1st Decade

Asian ports - cargo traffic of ports according to sub-regions 1994 - 2009 (Index 1994 = 100)



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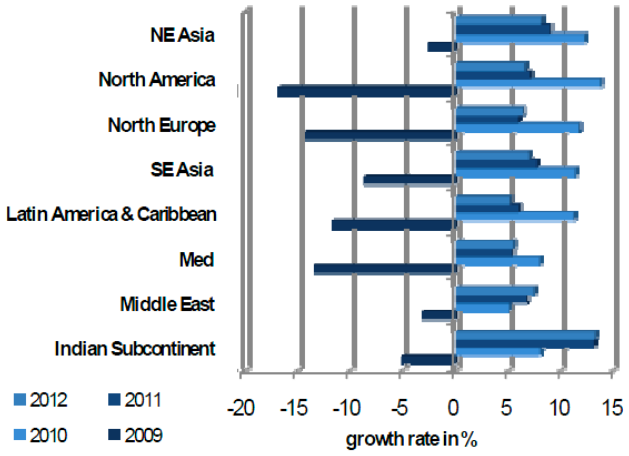
Rank	Countries	Amount	Date
# 1	China:	88,548,470 TEU	2005
# 2	United States:	38,519,040 TEU	2005
# 3	Singapore:	23,192,200 TEU	2005
# 4	Japan:	16,777,410 TEU	2005
# 5	Korea, South:	15,113,280 TEU	2005
# 6	Germany:	13,507,040 TEU	2005
# 7	Malaysia:	12,027,050 TEU	2005
# 8	Italy:	9,855,451 TEU	2005
# 9	United Arab Emirates:	9,845,930 TEU	2005
# 10	Netherlands:	9,520,844 TEU	2005
# 11	Spain:	9,170,109 TEU	2005
# 12	United Kingdom:	8,598,891 TEU	2005
# 13	Belgium:	7,889,994 TEU	2005
# 14	Brazil:	5,598,110 TEU	2005
# 15	Indonesia:	5,503,176 TEU	2005
# 16	Thailand:	5,115,213 TEU	2005
# 17	India:	4,938,226 TEU	2005
# 18	Australia:	4,830,254 TEU	2005
# 19	Canada:	4,163,424 TEU	2005
# 20	France:	3,839,739 TEU	2005
# 21	Egypt:	3,690,691 TEU	2005
# 22	Philippines:	3,633,559 TEU	2005
# 23	Turkey:	3,170,357 TEU	2005
# 24	Panama:	3,067,637 TEU	2005
# 25	South Africa:	2,867,909 TEU	2005

World merchandise trade by region and selected countries 2009 (bill US$ and per cent)

	Exports				Imports			
	Value	Annual % change			Value	Annual % change		
	2009	2005-09	2008	2009	2009	2005-09	2008	2009
EU 25 (a)	4567	3.0	10.8	-22.8	4714	3.0	12.0	-24.8
Germany	1121	4.0	10.8	-23.5	931	5.0	14.2	-22.8
Asia	3566	6.0	13.9	-24.3	3397	6.0	19.3	-25.2
China	1202	12.0	17.2	-15.9	1006	11.0	18.5	-11.2
Japan	581	-1.0	9.5	-25.7	551	2.0	22.5	-27.7
United States	1057	4.0	11.9	-18.7	1604	-2.0	7.2	-25.9
Latin America	461	6.0	21.0	-23.5	444	10.0	30.0	-25.4
Africa	379	5.0	29.2	-32.5	400	12.0	26.6	-14.2
Russia	304	6.0	33.1	-35.6	192	11.0	30.6	-34.2
World	12147	4.0	15.2	-24.7	12385	4.0	15.0	-24.6

Source: WTO; World Trade Report 2010

Growth rates of containerized imports by region 2009- 2012



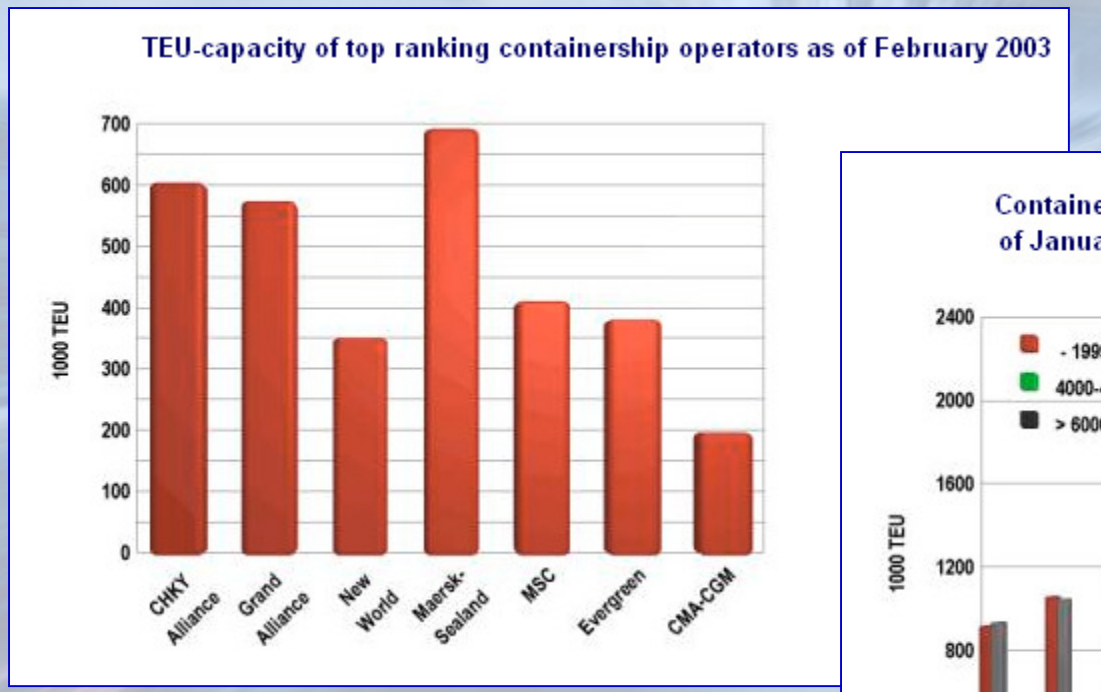
Source: IHS Global Insight; World Trade Service

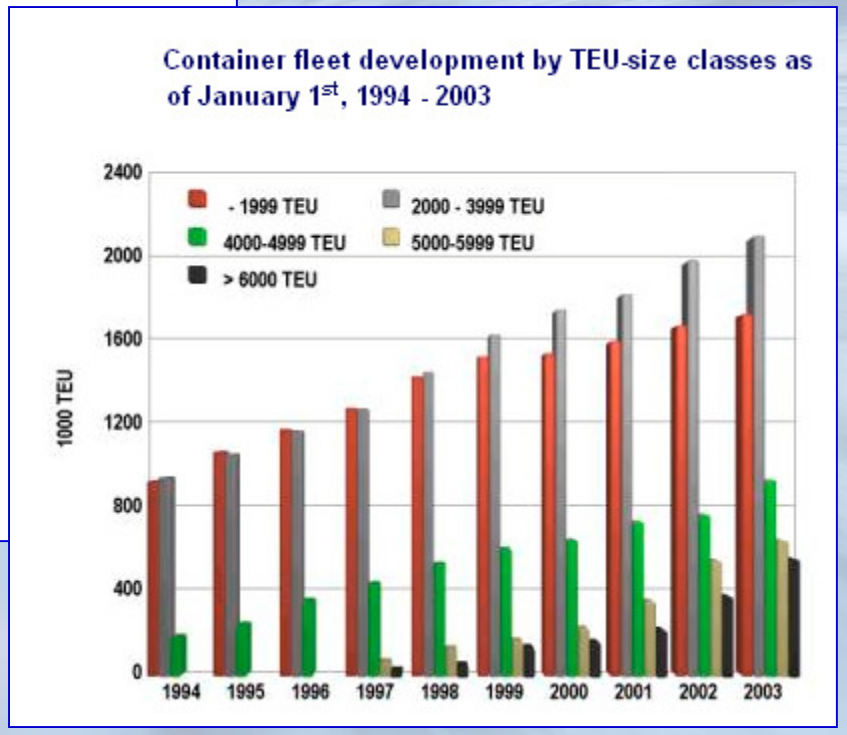
World output by country/country groups up to 2011

			Annual per cent change			
			Current projection		Differences from July 2010	
	2008	2009	2010	2011	2010	2011
WORLD OUTPUT	2.8	-0.6	4.8	4.2	0.2	-0.1
Advanced economies	0.2	-3.2	2.7	2.2	0.1	-0.2
of which						
United States	0.0	-2.6	2.6	2.3	-0.7	-0.6
Euro area	0.5	-4.1	1.7	1.5	0.7	0.2
Japan	-1.2	-5.2	2.8	1.5	0.4	-0.3
Gemany	1.0	4.7	3.3	2.0	1.9	0.4
Emerging markets and developing countries	6.0	2.5	7.1	6.4	0.3	0.0
of which						
Asia	7.7	6.9	9.4	8.4	0.2	-0.1
ASEAN-5*	4.7	1.7	6.6	5.4	0.2	-0.1
China	9.6	9.1	10.5	9.6	-	-
India	6.4	5.7	9.7	8.4	0.3	-

Source: ISL 2010, based on IMF: World Economic Outlook, October 2010

Container Fleet: Operator & Evolution



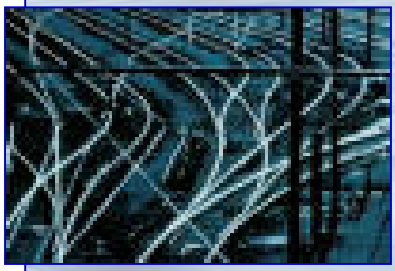


Transportation Directions in USA

Modal Shares of Commercial Freight Activity in the United States by Mode of Transportation: 1993, 1997, 2002

Mode of Transportation	1993			1997			2002		
	Value	Tons	Ton-miles	Value	Tons	Ton-miles	Value	Tons	Ton-miles
Combined total (CFS plus out-of-scope estimates)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Truck	65.1	54.5	25.6	61.9	59.5	28.4	63.7	58.2	32.1
Rail	3.9	11.8	26.5	4.3	10.9	27.3	3.7	12.0	27.8
Water	8.6	15.9	24.3	8.8	15.4	20.8	8.3	14.8	16.3
Air (includes truck and air)	5.5	0.1	0.2	7.7	0.1	0.4	7.4	0.1	0.3
Pipeline	4.3	11.9	16.3	2.7	9.7	15.8	2.7	10.5	16.7
Multimodal combinations (1)	9.2	1.7	4.6	11.0	1.5	5.4	10.6	1.3	5.0
Other and unknown modes	3.4	4.0	2.5	3.6	3.0	1.9	3.6	3.2	1.7

(1) Multimodal includes the traditional intermodal combination of truck and rail plus truck and water; rail and water; parcel, postal, and courier service; and other multiple modes for the same shipment.



World Ports Top 50: *2002*

WORLD PORT RANKING - 2002								
TOTAL CARGO VOLUME, METRIC TONS (000s)					CONTAINER TRAFFIC (TEUs, 000s)			
RANK	PORT	COUNTRY	MEASURE	TONS	RANK	PORT	COUNTRY	TEUs
1	Singapore	Singapore	MT	335'156	1	Hong Kong	China	19'144
2	Rotterdam	Netherlands	MT	321'851	2	Singapore	Singapore	16'941
3	Shanghai	China	MT	238'606	3	Busan	South Korea	9'436
4	South Louisia	United States	MT	196'445	4	Shanghai	China	8'620
5	Hong Kong	China	MT	192'510	5	Kaohsiung	Tawian	8'493
6	Houston (TX)	United States	MT	161'190	6	Shenzhen	China	7'614
7	Chiba	Japan	FT	158'929	7	Rotterdam	Netherlands	6'515
8	Nagoya	Japan	FT	158'020	8	Los Angeles	United States	6'106
9	Kwangyang	South Korea	RT	153'447	9	Hamburg	Germany	5'374
10	Ningbo	China	MT	150'000	10	Antwerp	Belgium	4'777
11	Ulsan	South Korea	RT	148'412	11	Port Kelang	Malaysia	4'533
12	Inchon	South Korea	RT	146'181	12	Long Beach	United States	4'524
13	Busan	South Korea	RT	143'772	13	Dubai	United Arab E	4'194
14	Guangzhou	China	MT	140'395	14	Yantian	China	4'181
15	Antwerp	Belgium	MT	131'629	15	New York/Ne	United States	3'749
16	Kaohsiung	Taiwan	MT	129'414	16	Quingdao	China	3'410
17	Tianjin	China	MT	129'000	17	Bremen/Brem	Germany	3'032
18	New York/Ne	United States	MT	122'103	18	Gioia Tauro	Italy	2'954
19	Qinhuangdao	China	MT	121'152	19	Felixstowe	United Kingdo	2'750
20	Qingdao	China	MT	120'000	20	Tokyo	Japan	2'712
21	Yokohama	Japan	FT	118'072	21	Tanjung Priok	Indonesia	2'680
22	Dalian	China	MT	107'538	22	Tanjung Pele	Indonesia	2'660
23	Hamburg	Germany	MT	98'272	23	Laem Chaba	Thailand	2'657
24	Marseilles	France	MT	92'261	24	Manila	Philippines	2'462
25	Dampier	Australia	MT	92'228	25	Tianjin	China	2'410
26	Osaka	Japan	FT	86'499	26	Yokohama	Japan	2'365
27	Kitakyushu	Japan	FT	84'249	27	Algeciras	Spain	2'234
28	Tokyo	Japan	FT	82'945	28	Guangzhou	China	2'180
29	Port Kelang	Malaysia	FT	82'271	29	Kobe	Japan	1'993
30	Port Hedland	Australia	MT	81'758	30	Jawarlal Nehr	India	1'967
31	Richards Bay	South Africa	HT	81'509	31	Nagoya	Japan	1'927
32	Kobe	Japan	FT	78'601	32	Keelung	Taiwan	1'919
33	Beaumont (T	United States	MT	77'990	33	Ningbo	China	1'860
34	New Orleans	United States	MT	77'163	34	Valencia	Spain	1'821
35	Newcastle	Australia	MT	76'887	35	Colombo	Sri Lanka	1'765
36	Shenzhen	China	MT	75'882	36	Xiamen	China	1'750
37	Tubarão	Brazil	MT	75'865	37	LeHavre	France	1'720
38	Hay Point	Australia	MT	74'672	38	Oakland	United States	1'708
39	Huntington,	United States	MT	73'590	39	Melbourne	Australia	1'600
40	Amsterdam	Netherlands	MT	70'417	40	Charleston	United States	1'593
41	LeHavre	France	MT	67'698	41	Genoa	Italy	1'531
42	Corpus Christ	United States	MT	65'362	42	Osaka	Japan	1'515
43	Itaqui	Brazil	MT	64'942	43	Tacoma (WA	United States	1'471
44	Novorossiysk	Russia	MT	63'291	44	Barcelona	Spain	1'461
45	Vancouver	Canada	MT	62'801	45	Vancouver (B	Canada	1'458
46	Long Beach (	United States	MT	61'615	46	Seattle	United States	1'439
47	Baton Rouge	United States	MT	54'997	47	Hampton Ro	United States	1'438
48	Gladstone	Australia	MT	54'466	48	Tanjung Pera	Indonesia	1'418
49	Plaquemines	United States	MT	53'661	49	Piraeus	Greece	1'405
50	Santos	Brazil	MT	53'474	50	Jeddah	Saudi Arabia	1'367

Abbreviations: MT=Metric Ton HT= Harbor Ton. FT=Freight Ton. RT = Revenue Ton.

NOTE: ***The cargo rankings based on tonnage should be interpreted with caution since these measures are not directly comparable and cannot be converted to a single, standardized unit.***

Sources: *Shipping Statistics Yearbook 2003*; Containerisation International Yearbook 2004;U.S. Army Corps of Engineers, *Waterborne Commerce of the United States CY 2002; AAPA Advisory*, May 12, 2003; various

World Ports Top 50: 2008

WORLD PORT RANKING - 2008								
TOTAL CARGO VOLUME					CONTAINER TRAFFIC			
THOUSANDS OF TONS					TEUs - Twenty-Foot Equivalent Units			
RANK	PORT	COUNTRY	MEASURE	TONS	RANK	PORT	COUNTRY	TEUS
1	Singapore	Singapore	freight	515,415	1	Singapore	Singapore	29,918,200
2	Shanghai	China	metric	508,000	2	Shanghai	China	28,006,400
3	Rotterdam	Netherlands	metric	421,136	3	Hong Kong	China	24,494,229
4	Tianjin	China	metric	365,163	4	Shenzhen	China	21,416,400
5	Ningbo	China	metric	361,850	5	Busan	South Korea	13,445,693
6	Guangzhou	China	metric	347,000	6	Dubai Ports	UAE	11,827,299
7	Qingdao	China	metric	278,271	7	Ningbo	China	11,226,000
8	Hong Kong	China	metric	259,402	8	Guangzhou	China	11,001,400
9	Qinhuangdao	China	metric	252,000	9	Rotterdam	Netherlands	10,783,825
10	Dalian	China	metric	246,000	10	Qingdao	China	10,024,400
11	Busan	South Korea	revenue	241,683	11	Hamburg	Germany	9,737,110
12	Nagoya	Japan	freight	218,130	12	Kaohsiung	Taiwan	9,676,554
13	Shenzhen	China	metric	211,000	13	Antwerp	Belgium	8,662,891
14	South Louisiana	US	metric	203,157	14	Tianjin	China	8,502,700
15	Houston	US	metric	192,473	15	Port Kelang	Malasyia	7,973,579
16	Antwerp	Belgium	metric	189,390	16	Los Angeles	US	7,849,985
17	Ulsan	South Korea	revenue	170,279	17	Long Beach	US	6,350,125
18	Chiba	Japan	freight	165,143	18	Bremen/Bremerhaven	Germany	5,488,189
19	Port Hedland	Australia	metric	159,391	19	Tanjung Pelepas	Malasyia	5,466,191
20	Port Kelang	Malasyia	freight	152,348	20	New York/New Jersey	US	5,265,058
21	Rizhao	China	metric	151,000	21	Laem Chabang	Thailand	5,128,057
22	Yingkou	China	metric	151,000	22	Xiamen	China	5,034,622
23	Kaohsiung	Taiwan	metric	146,729	23	Dalian	China, PR of	4,525,500
24	Inchon	South Korea	revenue	141,815	24	Tanjung Priok	Indonesia	3,984,278
25	Yokohama	Japan	freight	141,764	25	Nhava Sheva	India	3,952,735
26	Dampier	Australia	metric	140,823	26	Tokyo	Japan	3,727,300
27	Hamburg	Germany	metric	140,375	27	Colombo	Sri Lanka	3,689,762
28	New York/New Jersey	US	metric	139,207	28	Valencia	Spain	3,602,112
29	Nantong	China	metric	132,000	29	Yokohama	Japan	3,481,492
30	Vancouver	Canada	metric	114,574	30	Gioia Tauro	Italy	3,481,043
31	Yantai	China	metric	112,000	31	Jeddah	Saudi Arabia	3,325,750
32	Nanjing	China	metric	111,000	32	Algeciras - La Linea	Spain	3,324,310
33	Kitakyushu	Japan	freight	109,367	33	Felixstowe (TEU)	UK	3,251,077
34	Tangshan	China	metric	109,000	34	Mina Raysut (Salalah)	Oman	3,068,320
35	Itaqui	Brazil	metric	105,187	35	Lianyungang	China	3,000,500
36	lianyungang	China	metric	101,000	36	Manila	Philippines	2,997,022
37	Tubarao	Brazil	metric	99,873	37	Nagoya	Japan	2,816,827
38	Marseilles	France	metric	96,009	38	Santos	Brazil	2,677,839
39	Newcastle	Australia	metric	95,839	39	Durban	South Africa	2,642,165
40	Kobe	Japan	freight	95,186	40	Savannah	US	2,616,126
41	Amsterdam Ports	Netherlands	metric	94,768	41	Barcelona	Spain	2,569,549
42	Osaka	Japan	freight	92,976	42	Kobe	Japan	2,556,584
43	Tanjung Pelepas	Malasyia	metric	87,939	43	Metro Port Vancouver (BC)	Canada	2,492,107
44	Sepetiba	Brazil	metric	84,888	44	Le Havre	France	2,488,654
45	Richards Bay	South Africa	metric	84,534	45	East Port Said Port	Egypt	2,331,962
46	Hay Point	Australia	metric	82,519	46	Marsaxlokk	Malta	2,300,000
47	Novorossisk	Russia	metric	81,633	47	Oakland	US	2,236,244
48	Tokyo	Japan	metric	81,328	48	Colon	Panama	2,219,278
49	Santos	Brazil	metric	81,058	49	Zeebrugge	Belgium	2,209,715
50	Le Havre	France	metric	80,527	50	Balboa	Panama	2,167,977
51	Corpus Christi	US	metric	79,079	51	Melbourne	Australia	2,157,352
52	Gladstone	Australia	metric	78,801	52	Khor Fakkan	UAE	2,112,441
53	Primorsk	Russia	metric	75,582	53	Hampton Roads	US	2,083,278
54	Bremen/Bremerhaven	Germany	metric	74,647	54	Keelung	Taiwan	2,055,259

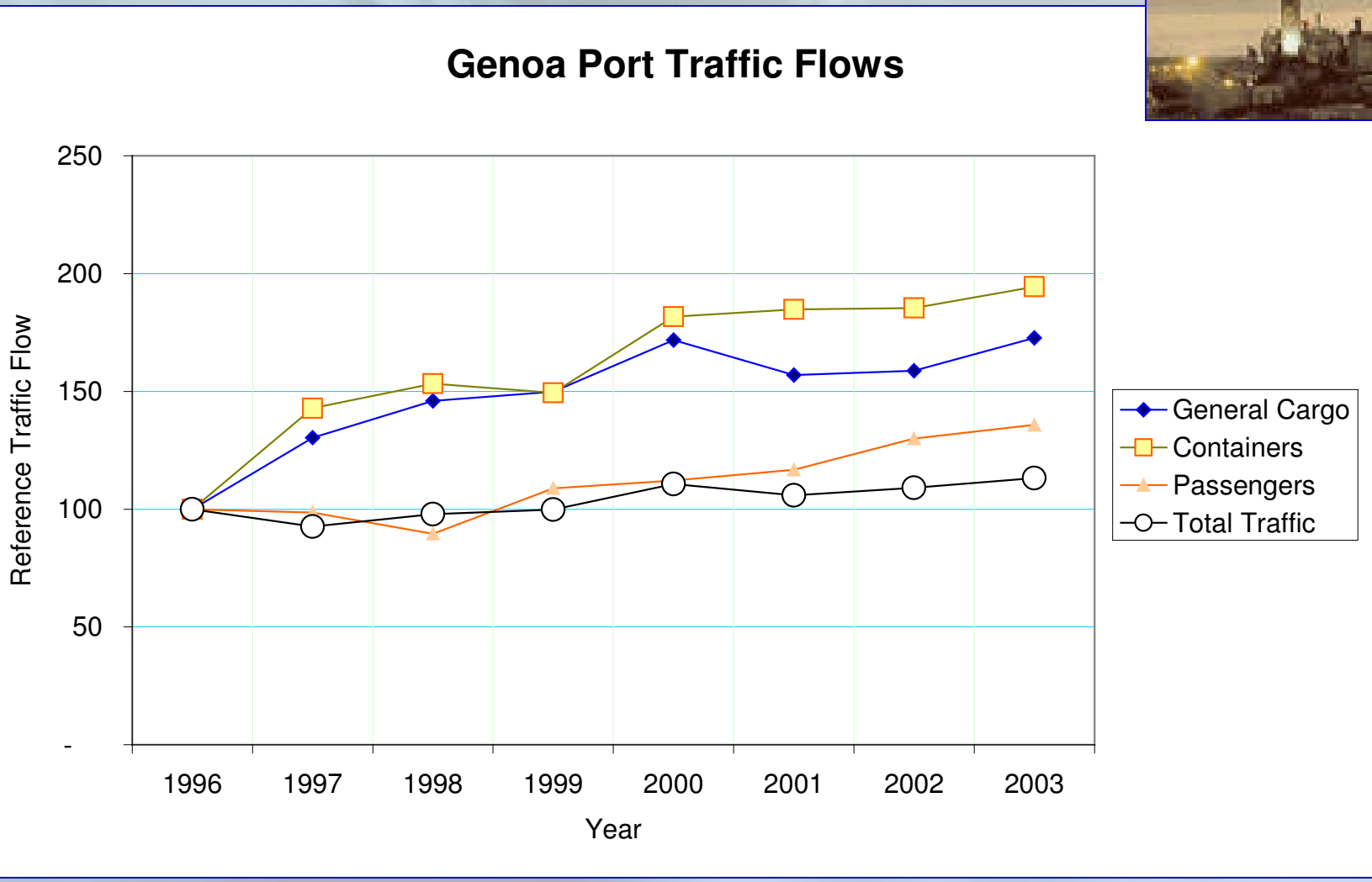
Genoa ranked 73th World Port with 54'214 Tons
and 69th in Container Traffic with 1'766'605 TEUs

World Ports Top 50: 2010

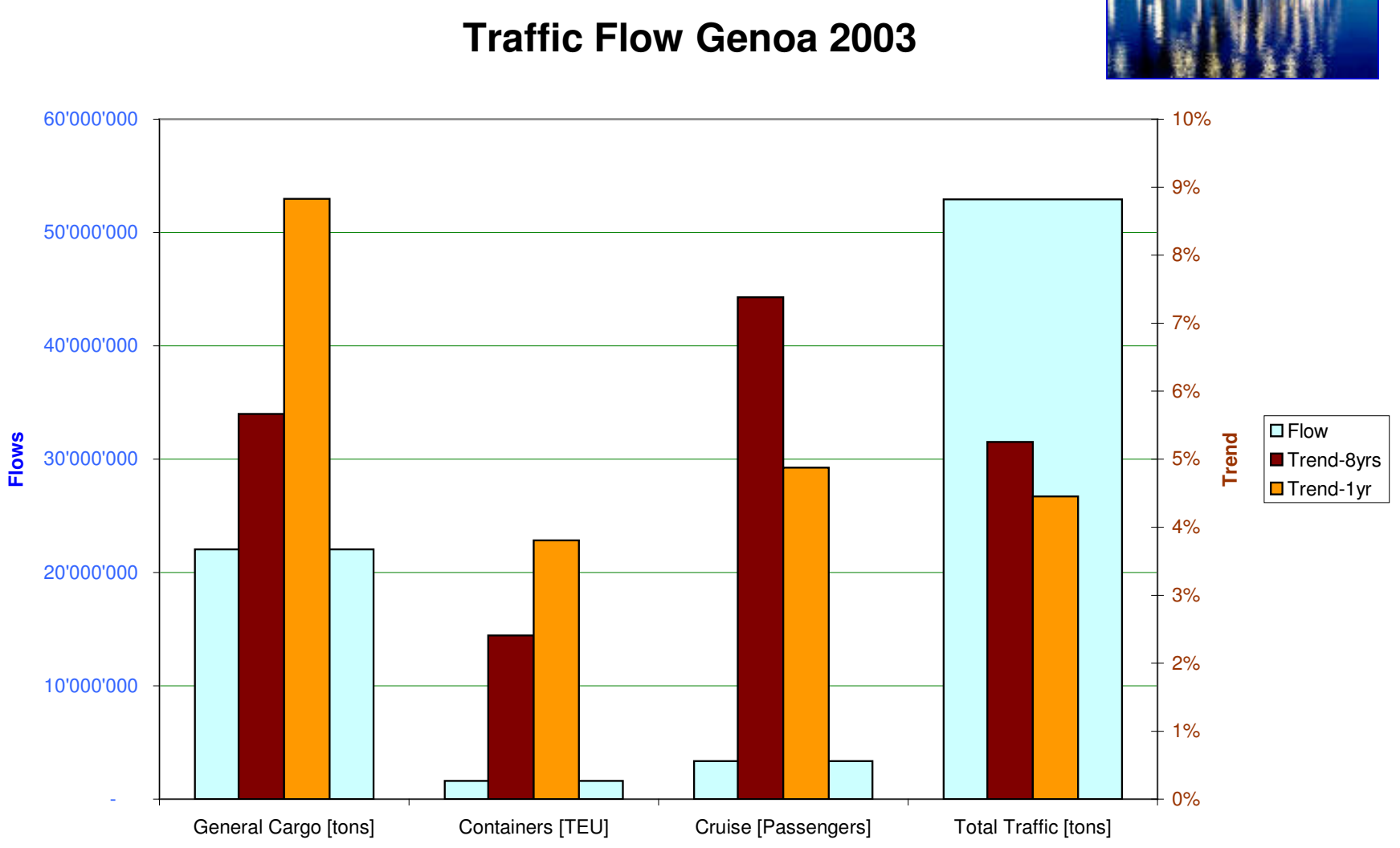
WORLD PORT RANKINGS - 2010								
TOTAL CARGO VOLUME THOUSANDS OF TONS					CONTAINER TRAFFIC TEUs - Twenty-Foot Equivalent Units			
RANK	PORT	COUNTRY	MEASURE	TONS	RANK	PORT	COUNTRY	TEUS
1	Shanghai	China	Metric Tons	534,371	1	Shanghai	China	29,069,000
2	Singapore	Singapore	Freight Tons	501,566	2	Singapore	Singapore	28,431,100
3	Rotterdam	Netherlands	Metric Tons	429,926	3	Hong Kong	China	23,669,242
4	Guangzhou	China	Metric Tons	425,600	4	Shenzhen	China	22,509,700
5	Ningbo	China	Metric Tons	408,150	5	Busan	South Korea	14,194,334
6	Tianjin	China	Metric Tons	400,000	6	Ningbo	China	13,144,000
7	Qingdao	China	Metric Tons	350,120	7	Guangzhou	China	12,486,900
8	Qinhuangdao	China	Metric Tons	276,282	8	Qingdao	China	12,012,000
9	Hong Kong	China	Metric Tons	267,815	9	Dubai Ports	United Arab Emirates	11,575,775
10	Busan	South Korea	Revenue Tons	262,963	10	Rotterdam	Netherlands	11,145,804
11	South Louisiana	United States	Metric Tons	214,337	11	Tianjin	China	10,080,000
12	Houston	United States	Metric Tons	206,055	12	Kaohsiung	Taiwan	9,121,211
13	Shenzhen	China	Metric Tons	204,860	13	Port Kelang	Malaysia	8,871,745
14	Dalian	China	Metric Tons	200,000	14	Antwerp	Belgium	8,468,475
15	Port Hedland	Australia	Metric Tons	198,997	15	Hamburg	Germany	7,895,736
16	Nagoya	Japan	freight tons	185,703	16	Los Angeles	United States	7,831,902
17	Antwerp	Belgium	Metric Tons	178,167	17	Tanjung Pelepas	Malaysia	6,298,734
18	Port Kelang	Malasyia	Freight Tons	168,558	18	Long Beach	United States	6,263,499
19	Dampier	Australia	Metric Tons	165,025	19	Xiamen	China	5,824,256
20	Chiba	Japan	Freight Tons	155,256	20	New York/New Jersey	United States	5,292,023
21	Ulsan	South Korea	Revenue Tons	150,993	21	Dalian	China	5,242,000
22	Inchon	South Korea	Revenue Tons	149,077	22	Laem Chabang	Thailand	5,068,076
23	Tubarao	Brazil	Metric Tons	132,031	23	Bremen/Bremerhaven	Germany	4,888,655
24	Dubai Ports	United Arab Emirates	Metric Tons	130,518	24	Tanjung Priok	Indonesia	4,714,857
25	Yokohama	Japan	Freight Tons	129,640	25	Tokyo	Japan	4,284,944
26	Xiamen	China	Metric Tons	127,281	26	Jawaharlal Nehru (Nhava Sheva)	India	4,269,811
27	New York/New Jersey	United States	Metric Tons	126,281	27	Valencia	Spain	4,206,937
28	Kaohsiung	Taiwan	Metric Tons	124,950	28	Colombo	Sri Lanka	4,000,000
29	Hamburg	Germany	Metric Tons	121,187	29	Lianyunggang	China	3,870,000
30	Vancouver	Canada	Metric Tons	118,379	30	Ho Chi Minh	Vietnam	3,856,000
31	Itaqui	Brazil	Metric Tons	118,058	31	Jeddah	Saudi Arabia	3,830,857
32	Yantian	China	Metric Tons	116,589	32	Mina Raysut (Salalah)	Oman	3,485,395
33	Newcastle	Australia	Metric Tons	114,576	33	Port Said	Egypt	3,474,792
34	Kwangyang	South Korea	Revenue Tons	102,606	34	Felixstowe	United Kingdom	3,400,000
35	Kitakyushu	Japan	freight tons	98,844	35	Yingkou	China	3,338,000
36	Tanjung Pelepas	Malasyia	Metric Tons	97,656	36	Yokohama	Japan	3,280,191
37	Santos	Brazil	Metric Tons	96,026	37	Manila	Philippines	3,154,702
38	Amsterdam Ports	Netherlands	Metric Tons	90,644	38	Khor Fakkan	United Arab Emirates	3,022,524
39	Sepetiba	Brazil	Metric Tons	90,475	39	Gioia Tauro	Italy	2,851,261
40	Hay Point	Australia	Metric Tons	87,804	40	Savannah	United States	2,825,179
41	Marseilles	France	Metric Tons	85,997	41	Algeciras - La Linea	Spain	2,810,242
42	Kobe	Japan	Freight Tons	85,532	42	Balboa	Panama	2,758,506
43	Osaka	Japan	Freight Tons	85,283	43	Santos	Brazil	2,722,225
44	Richards Bay	South Africa	Metric Tons	85,148	44	Shahid Rajase	Iran	2,592,622
45	Novorossisk	Russia	Metric Tons	81,603	45	Kobe	Japan	2,556,291
46	Primorsk	Russia	Metric Tons	77,640	46	Nagoya	Japan	2,548,851
47	Tokyo	Japan	Metric Tons	77,515	47	Ambarli	Turkey	2,540,353
48	Gladstone	Australia	Metric Tons	73,900	48	Durban	South Africa	2,529,209
49	Bandar Abbas	Iran	Metric Tons	72,352	49	Port Metro Vancouver	Canada	2,514,309
50	Le Havre	France	Metric Tons	70,469	50	Zeebrugge	Belgium	2,389,879
51	Beaumont	United States	Metric Tons	69,817	51	Marsaxlokk	Malta	2,370,729
52	Bremen/Bremerhaven	Germany	Metric Tons	68,690	52	Le Havre	France	2,358,077
53	Long Beach	United States	Metric Tons	68,434	53	Oakland	United States	2,330,202
54	Corpus Christi	United States	Metric Tons	66,827	54	Melbourne	Australia	2,322,135
55	New Orleans	United States	Metric Tons	65,691	55	Taicang	China	2,211,500
56	Algeciras - La Linea	Spain	Metric Tons	65,531	56	Seattle	United States	2,133,548
57	Jawaharlal Nehru (Nhava Sheva)	India	Metric Tons	64,320	57	Colon	Panama	2,121,605
58	Valencia	Spain	Metric Tons	63,741	58	Kwangyang	South Korea	2,084,892
59	Madras	India	Metric Tons	62,019	59	Tangier	Morocco	2,058,430
60	Laem Chabang	Thailand	Metric Tons	59,529	60	Sydney Ports	Australia	2,020,086
61	Daesan	South Korea	Revenue Tons	58,961	61	Keelung	Taiwan	1,962,896
62	Taichung	Taiwan	Metric Tons	58,943	62	Barcelona	Spain	1,945,735
63	St. Petersburg	Russia	Metric Tons	57,967	63	St. Petersburg	Russia	1,931,382
64	Hampton Roads	United States	Metric Tons	56,617	64	Hampton Roads	United States	1,895,017
65	Los Angeles	United States	Metric Tons	56,597	65	Inchon	South Korea	1,887,000
66	Paradip	India	Metric Tons	56,030	66	Kingston	Jamaica	1,848,431
67	Bombay	India	Metric Tons	54,586	67	Houston	United States	1,812,268
68	Grimsby and Immingham	United Kingdom	Metric Tons	54,029	68	Genoa	Italy	1,758,858
69	Pohang	South Korea	Revenue Tons	53,192	69	Buenos Aires (Including Exolgen)	Argentina	1,736,398
70	Saldanha Bay	South Africa	Metric Tons	53,107	70	Cartagena	Colombia	1,581,401
71	Texas City	United States	Metric Tons	51,339	71	Southampton	United Kingdom	1,540,000
72	Genoa	Italy	Metric Tons	50,702	72	San Juan	United States	1,525,532

Genoa ranked 72h World Port with 50'702 Tons
and 69th in Container Traffic with 1'758'858 TEUs

Genoa Port Evolution



Genoa Trends

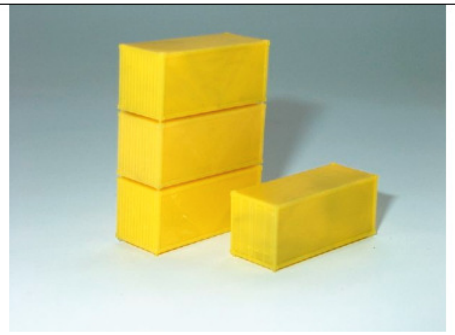


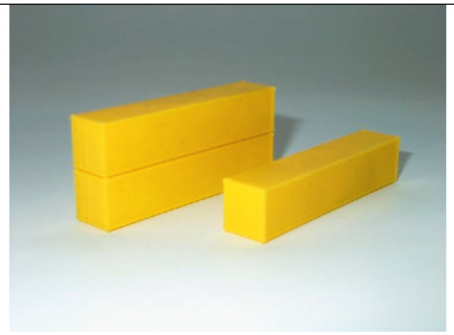
Intermodal?

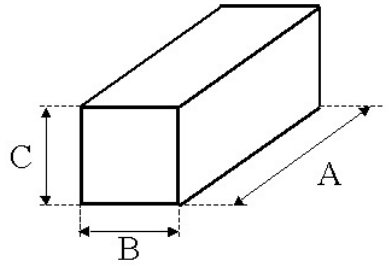
Intermodal freight transport involves the transportation of freight in a container or vehicle, using multiple modes of transportation (rail, ocean vessel, and truck), without any handling of the freight itself when changing modes.

The advantage of utilizing this method is that it reduces cargo handling, and so improves security, reduces damages and loss, and allows freight to be transported faster.

Containers… How?







	Contenitore da 20 piedi *20′*	*Contenitore da 40 piedi* *40′*
A	6.08 m	12.16 m
B	2.50 m	2.50 m
C	2.50 m	2.50 m

Containers?

Containers are the Ideal support for Intermodal Logistics.

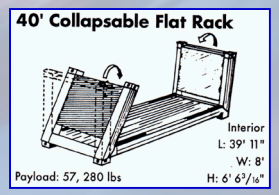
There are two major classes of Containers 20' (6 meter long) and 40' (12 meter long)

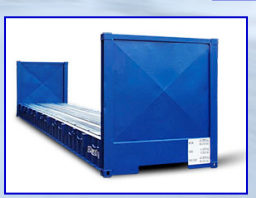
		20' container		40' container		45' high-cube container	
		imperial	metric	imperial	metric	imperial	metric
external dimensions	length	19' 10½"	6.058 m	40' 0"	12.192 m	45' 0"	13.716 m
	width	8' 0"	2.438 m	8' 0"	2.438 m	8' 0"	2.438 m
	height	8' 6"	2.591 m	8' 6"	2.591 m	9' 6"	2.896 m
interior dimensions	length	18' 10 5/16"	5.758 m	39' 5 45/64"	12.032 m	44' 4"	13.556 m
	width	7' 8 19/32"	2.352 m	7' 8 19/32"	2.352 m	7' 8 19/32"	2.352 m
	height	7' 9 57/64"	2.385 m	7' 9 57/64"	2.385 m	8' 9 15/16"	2.698 m
door aperture	width	7' 8 ⅛"	2.343 m	7' 8 ⅛"	2.343 m	7' 8 ⅛"	2.343 m
	height	7' 5 ¾"	2.280 m	7' 5 ¾"	2.280 m	8' 5 49/64"	2.585 m
volume		1,169 ft³	33.1 m³	2,385 ft³	67.5 m³	3,040 ft³	86.1 m³
maximum gross mass		52,910 lb	24,000 kg	67,200 lb	30,480 kg	67,200 lb	30,480 kg
empty weight		4,850 lb	2,200 kg	8,380 lb	3,800 kg	10,580 lb	4,800 kg
net load		48,060 lb	21,800 kg	58,820 lb	26,680 kg	56,620 lb	25,680 kg

How Many Containers?

In reality the number of ISO Containers is pretty High and Includes:

- **General purpose dry van** for boxes, cartons, cases, sacks, bales, pallets, drums in standard, high or half height
- **High cube** palletwide containers for europallet compatibility
- **Reefer**: Temperature controlled from -25 ℃ to +25 ℃
- **Open top** bulktainers for bulk minerals, heavy machinery
- **Open side** for loading oversize pallet
- Flushfolding **Flat-rack** containers for heavy and bulky semi-finished goods, out of gauge cargo
- **Platform** or bolster for barrels and drums, crates, cable drums, out of gauge cargo, machinery, and processed timber
- Ventilated containers for organic products requiring ventilation
- **Tank** containers for bulk liquids and dangerous goods
- **Rolling floor** for difficult to handle cargo
- Collapsible ISO
- **Swapbody**
- **Bulk Container**





Extra Long Containers?

Dry Containers 45 Feet are diffused for Rail/Shipping and Road Transportations in may countries

DRY CONTAINER - 20 FEET		Steel Specifications for 24,000kg	Steel Specifications for 30,480kg
Inside Measurement	Length (mm) Width (mm) Height (mm)	5,882-5,914 2,346-2,352 2,376-2,395	5,888-5,905 2,340-2,354 2,280-2,396
Door Opening	Width (mm) Height (mm)	2,336-2,377 2,267-2,283	2,280-2,348 2,200-2,393
Load Capacity	(m^3)	32.8-33.4	32.5-33.4
Container Weight	(kg)	1,960-2,350	2,170-2,330
Max. Load Weight	(kg)	21,650-22,040	28,150-28,310

DRY CONTAINER - 40 FEET		Steel Specifications for 8'6" / 30,480kg
Inside Measurement	Length (mm) Width (mm) Height (mm)	12,023-12,055 2,346-2,356 2,280-2,438
Door Opening	Width (mm) Height (mm)	2,278-2,390 2,260-2,343
Load Capacity	(m^3)	67.2-67.8
Container Weight	(kg)	2,850-3,900
Max. Load Weight	(kg)	26,580-27,630

DRY CONTAINER - 40 FEET HIGH CUBE		Steel Specifications for 9'6" / 30,480kg
Inside Measurement	Length (mm) Width (mm) Height (mm)	12,023-12,058 2,343-2,352 2,619-2,703
Door Opening	Width (mm) Height (mm)	2,336-2,346 2,577-2,591
Load Capacity	(m^3)	75.9-76.5
Container Weight	(kg)	2,980-4,150
Max. Load Weight	(kg)	26,330-27,500

DRY CONTAINER - 45 FEET		Steel Specifications for 9'6" / 30,480kg
Inside Measurement	Length (mm) Width (mm) Height (mm)	13,549-13,560 2,350-2,362 2,690-2,700
Door Opening	Width (mm) Height (mm)	2,340-2,345 2,585-2,591
Load Capacity	(m^3)	85.8-86.1
Container Weight	(kg)	4,490-4,950
Max. Load Weight	(kg)	25,530-25,990

Rail Transport

The Railways is a major vector in Intermodal Transport connecting Industrialized Areas with major Logistics Nodes (i.e.ports)

In different countries the limit and regulation for this transportation are different.

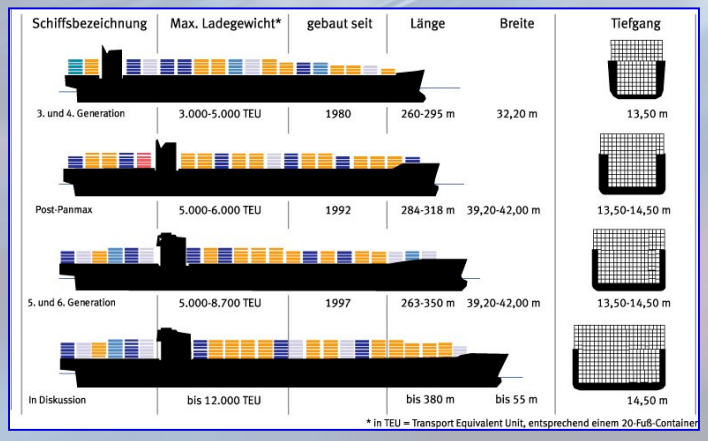
Spreader?

- **Functions: Open/Close, Change on Lenght, Width, Rotation, Axis**
- **Maximum Payload 30-60 tons (usually 40)**
- **Normally for Portainers it is able to Rotate 360° (i.e. for Custom Inspection)**
- **Sometime Twin Lift Capability**

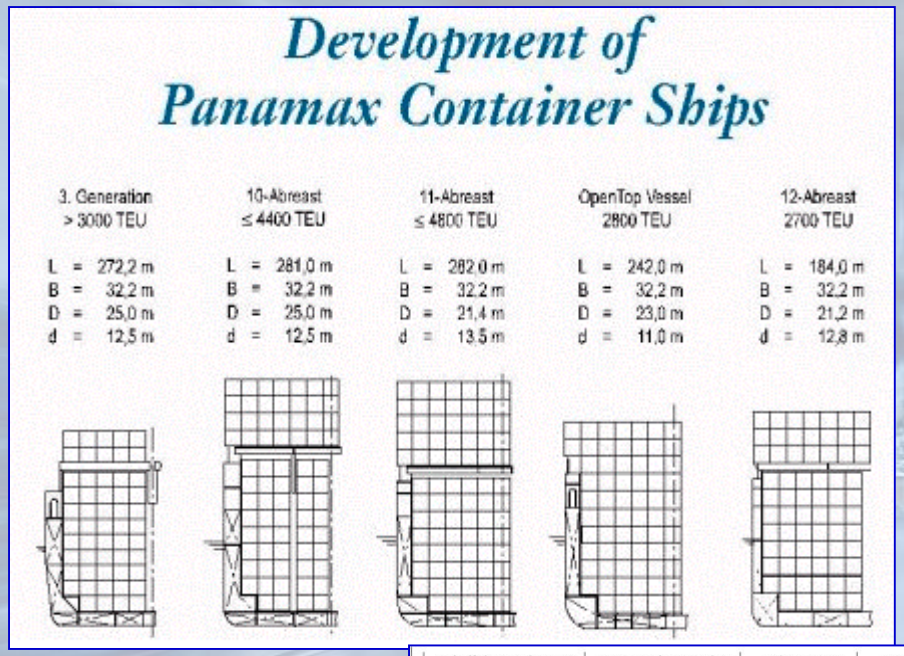
Ships

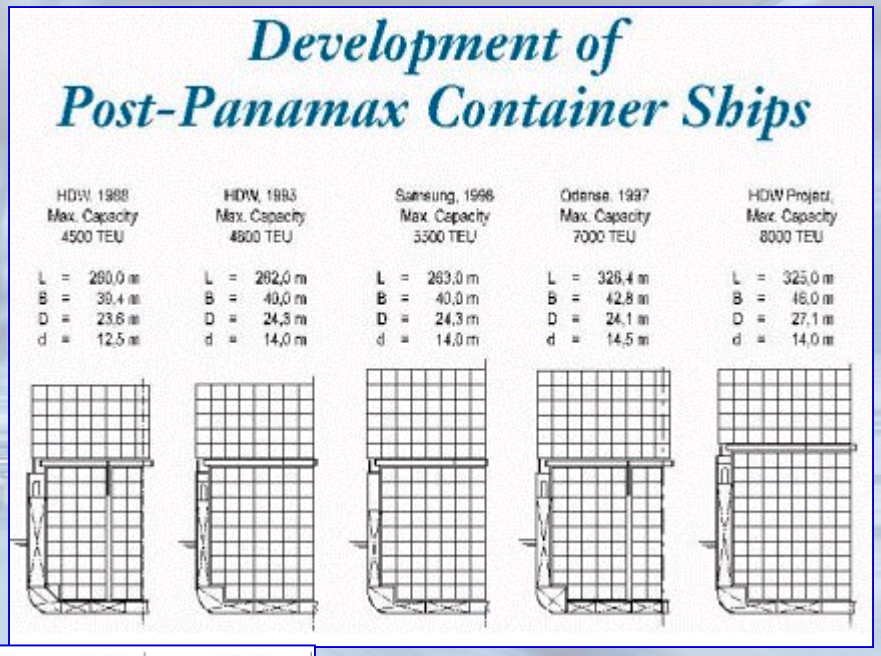
- **Containers:**
  - **FEEDER** — **Small Ships**
  - **PANAMAX** — **3'000-5'000 TEU - 32.3 m - 60'000-80'000 DWT**
  - **POST-PANAMAX** — **5'000-6'000 TEU - >32.3 m - 60'000-100'000 DWT**
  - **Super POST-PANAMAX** — **6'000-11'000 TEU -42 m - 80'0000-120'000 DWT 15 pescaggio**
  - **MALACCAMAX (Hyp.)** — **18'000 TEU - 60 m - 300'000 DWT**
- **Others**
  - **MALACCAMAX TANKERS** — **25m Deep (VLCC)**
  - **SUEXMAX TANKERS** — **120'000-175'000 DWT (no**
  - **CAPE SIZE BULKER** — **120'000 - 175'000 DWT**

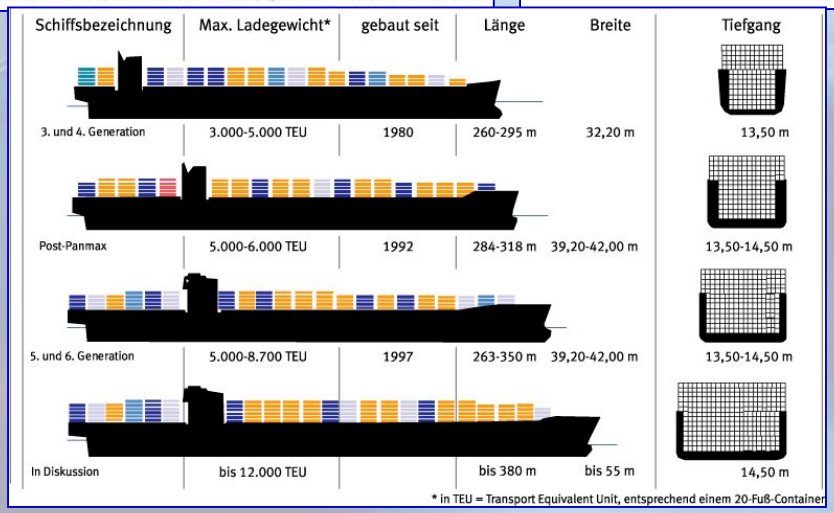
Anno	Nome	Lunghezza	Larghezza	TEU	BRT	Compagnia
2006	Emma Maersk	397.00 m	56.00 m	11000	/	Maersk Sealand/Danimarca
2005	Colombo Express	335.07 m	42.87 m	8750	94750	Hapag-Lloyd/Germania
2004	CSCL Europe	334.00 m	42.80 m	8498	99500	China Shipping Container Line/Cina
2003	OOCL Shenzhen	322.97 m	42.80 m	8063	89097	OOCL/Hong Kong
2003	Axel Maersk	352.10 m	42.80 m	7226 (8300)	93496	Maersk Sealand/Danimarca
1997	Sovereign Maersk	346.98 m	42.80 m	6600 (8000)	91500	Maersk Line/Danimarca
1996	Regina Maersk	318.24 m	42.80 m	6000 (7000)	80500	Maersk Line/Danimarca
1995	OOCL Hongkong	276.02 m	40.00 m	5344	66046	OOCL/Hongkong
1991	Hannover Express	294.00 m	32.30 m	4639	53783	Hapag-Lloyd/Germania
1988	Marchen Maersk	294.12 m	32.22 m	4300	53600	Maersk Line/Danimarca
1984	Louis Maersk	270.00 m	32.30 m	3390 (3700)	53300	Maersk Line/Danimarca
1981	Frankfurt Express	287.73 m	32.28 m	3430	57540	Hapag-Lloyd/Germania
1972	Hamburg Express	287.70 m	32.20 m	3010	58088	Hapag-Lloyd/Germania
1972	Tokyo Bay	289.32 m	32.26 m	2961	58889	OCL e in seguito P&O/Gran Bretagna
1971	Kamakura Maru	290.00 m	32.20 m	2500	59000	NYK/Giappone
1970	Sydney Express	217.00 m	30.58 m	1665	27407	Hapag-Lloyd/Germania
1969	Encounter Bay	227.31 m	30.56 m	1572	28800	OCL poi P&O/Gran Bretagna



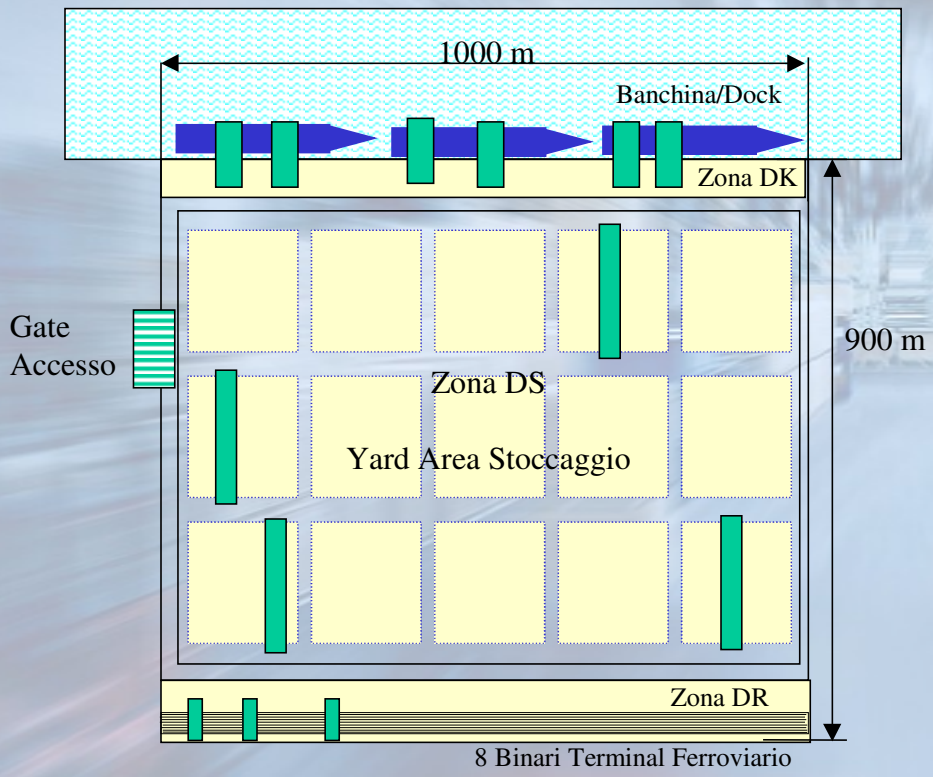
Panamax vs. Post Panamax







Container Terminal Layout



Dimensioni Area Stoccaggio DS 960 m x 700 m
Capacita' Stoccaggio = 45'000 TEU

Zona DK: Operazioni Banchina
Zona DS: Yard / Area Stoccaggio
Zona DR: Terminal Ferroviario

Direttrici e Mezzi Handling Flussi:

Import

From Ship To Feeder Ship
Nave⇒ DK ⇒ DK⇒Nave
PT+ Collegamento + PT

From Ship To Train
Nave.⇒ DK ⇒ DS ⇒ DR⇒Treno
PT+ Collegamento + WT +
WT+ Collegamento + RT

From Ship To Truck
Nave⇒ DK ⇒ DS ⇒ Camion Esterno
PT+ Collegamento + WT +
WT

Export

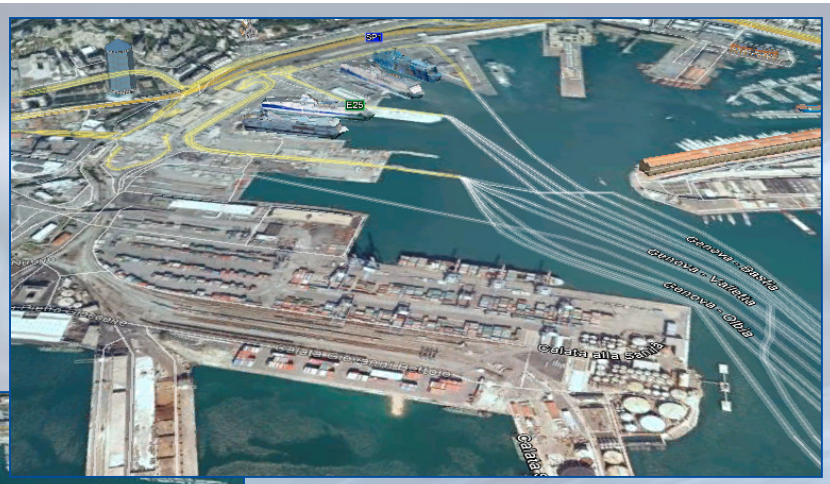
From Feeder Ship to Ship
Nave.⇒ DK ⇒ DK⇒ Nave
PT+ Collegamento + PT

From Train to Ship
Treno ⇒ DR ⇒ DS ⇒ DK ⇒ Nave
RT + Collegamento + WT +
WT + Collegamento + PT

From Truck To Ship
Camion Esterno ⇒ DS ⇒ DK⇒Nave
WT +
WT + Collegamento + PT

La Spezia:
High Intensity vs. Small Space

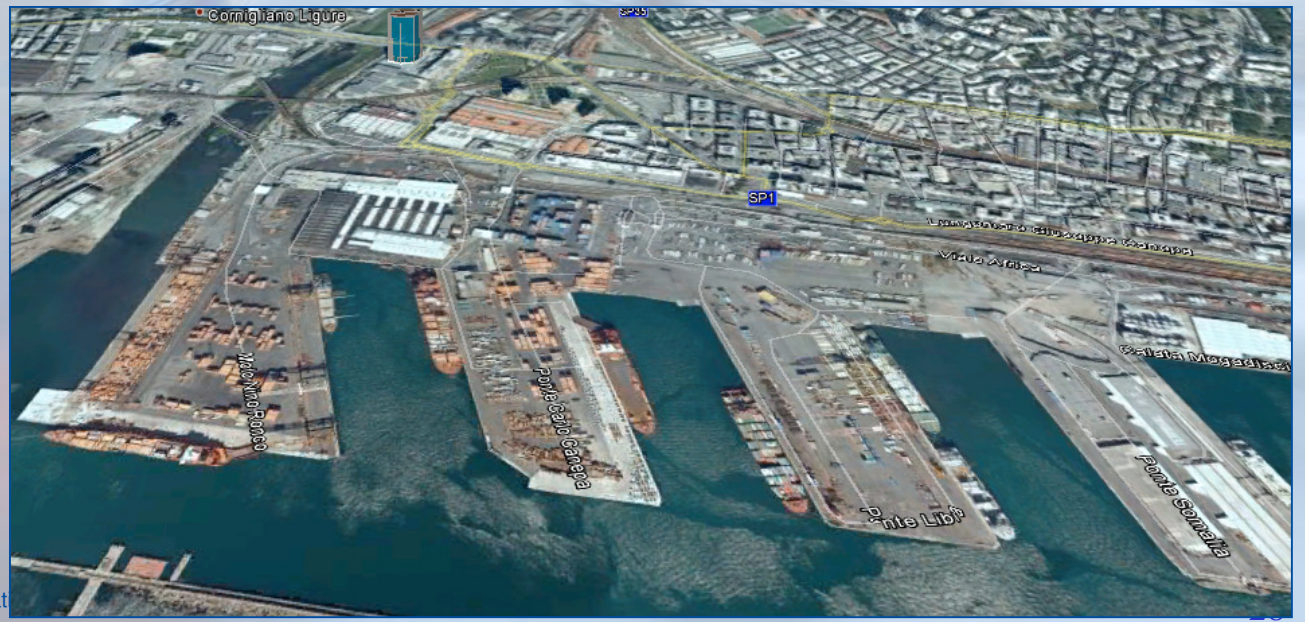
Genoa: Some Container Terminal



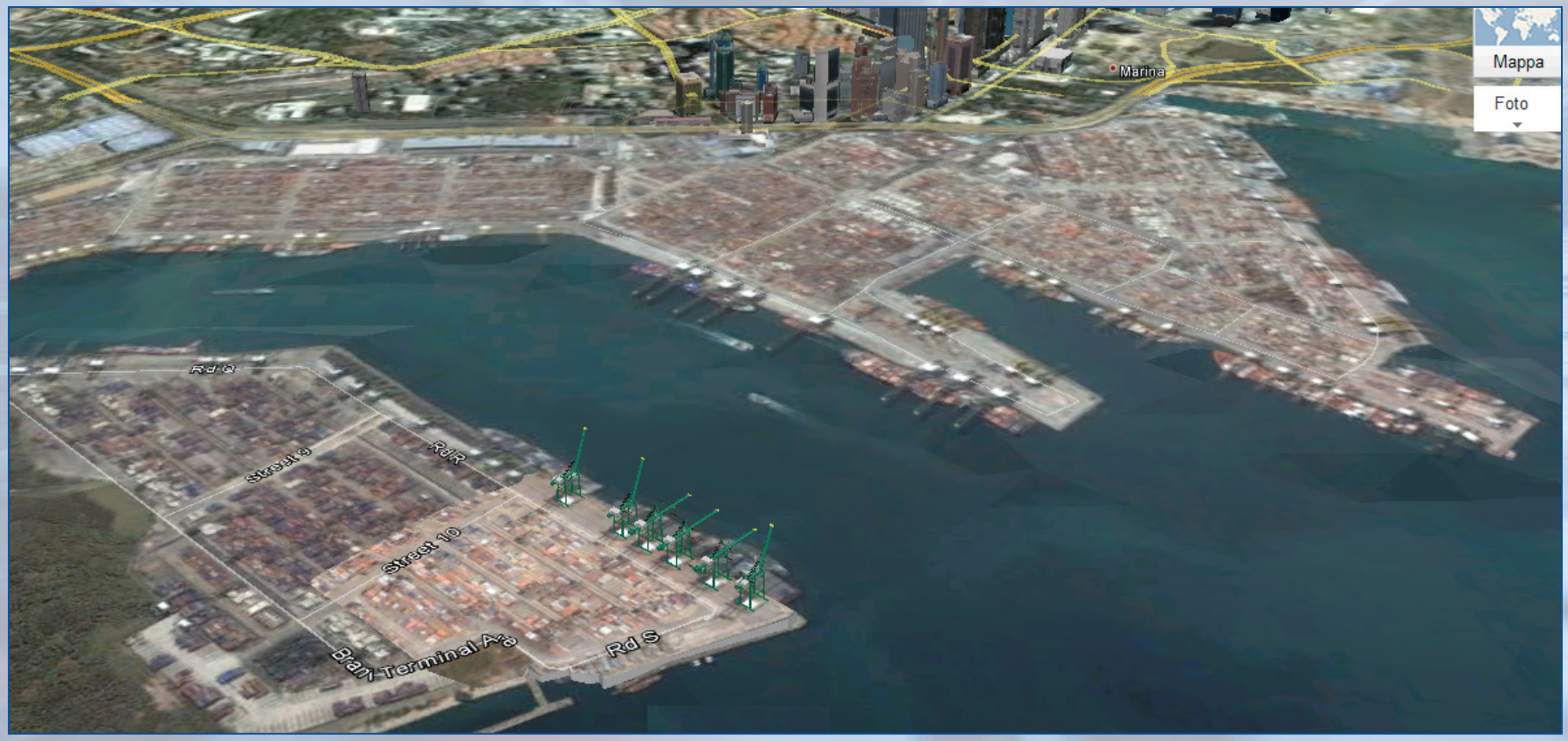
Sech

VTE Voltri

Terminal Messina



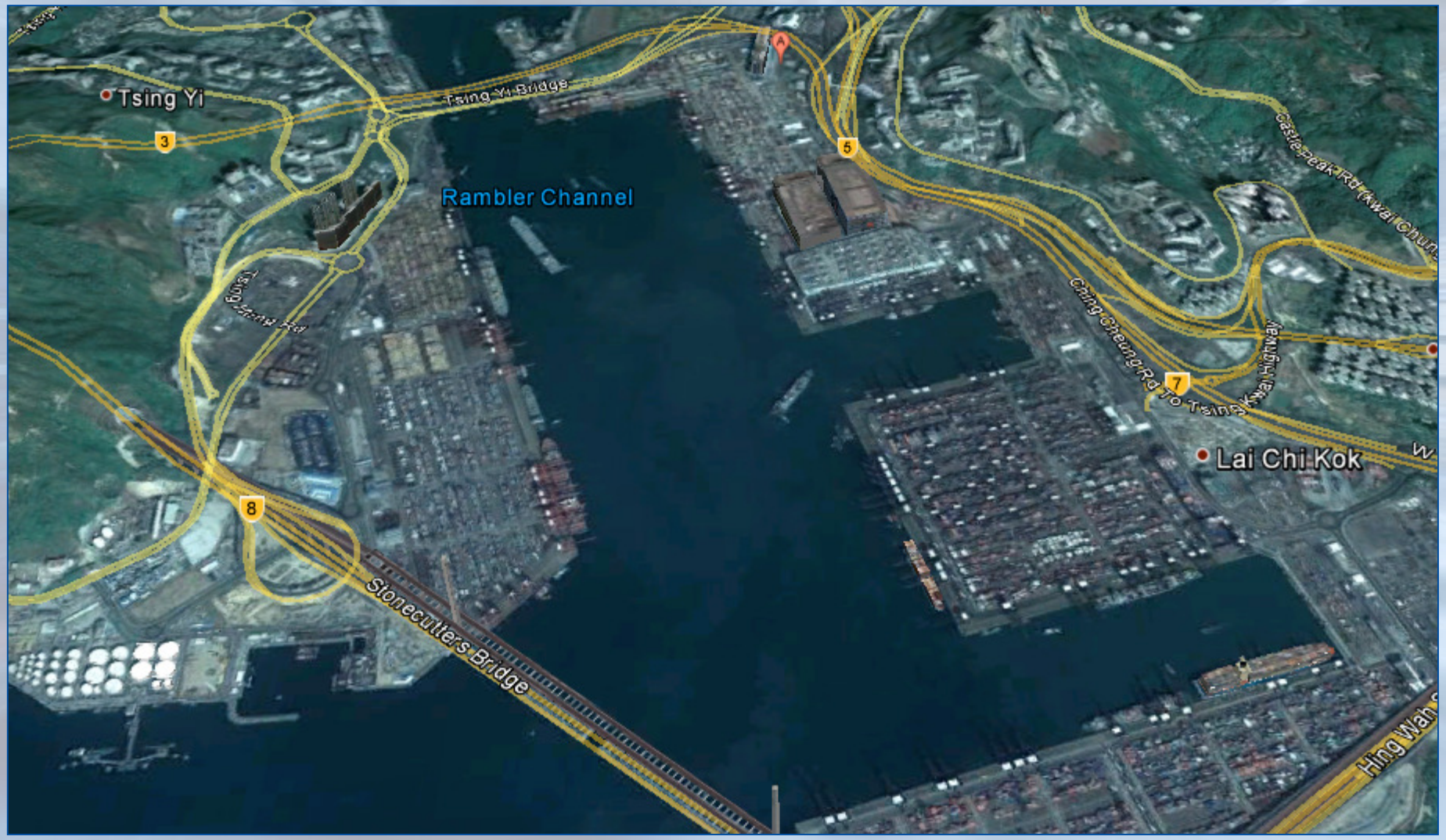
Singapore:
Very High Intensity Small Space



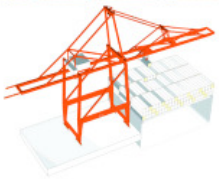
Rotterdam: Major in Europe

Shanghai: just about 3 times biggest than largest European

Hong Kong: Just 2nd in China and 200% of biggest European



Cranes



PT - Portainer
Gru di Banchina

WT - Transtainer Gommata
Gru di Piazzale

RT - Transtainer Ferrata
Gru Terminal Ferroviario

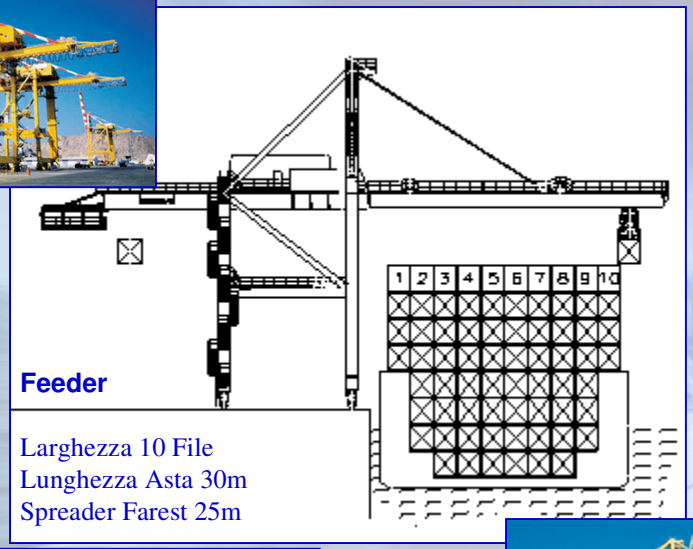
TT - Ralla (Motrice Rimorchio)
Collegamenti Interni

RS- Reachstacker
Movimentazione Container

SC- Straddle Carrier
Movimentazione Container

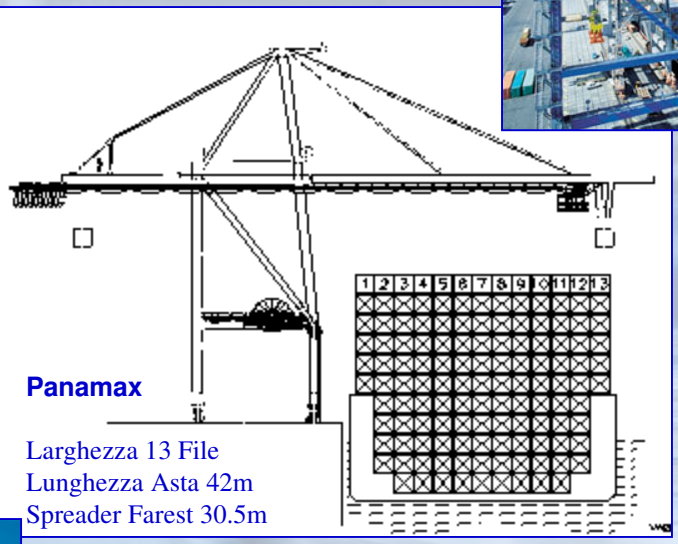
Equipaggiamenti per la Movimentazione di Contenitori/Container Handling

Dock , Ship & Portainers



Feeder

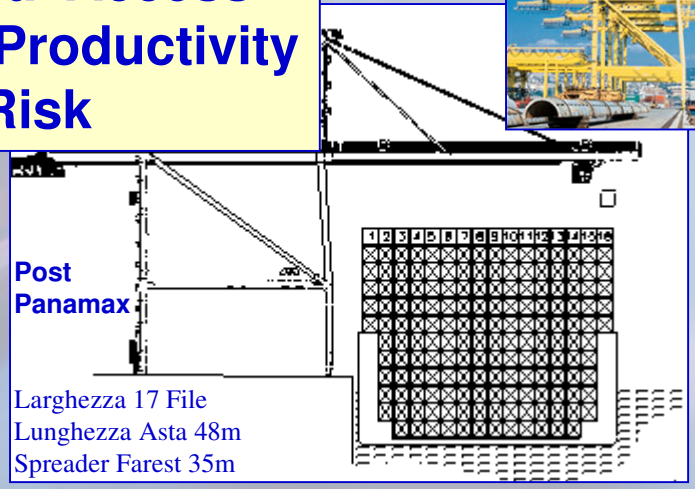
Larghezza 10 File
Lunghezza Asta 30m
Spreader Farest 25m



Panamax

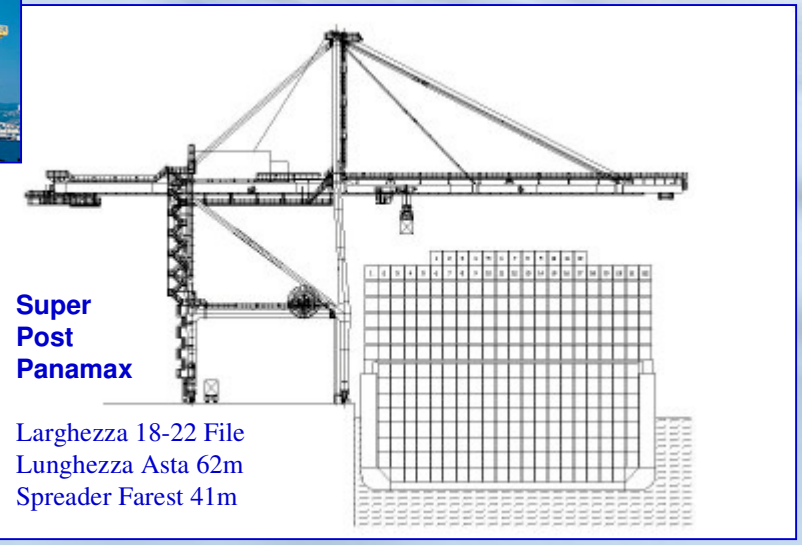
Larghezza 13 File
Lunghezza Asta 42m
Spreader Farest 30.5m

- **Vertical Access**
- **High Productivity**
- **Low Risk**



Post Panamax

Larghezza 17 File
Lunghezza Asta 48m
Spreader Farest 35m



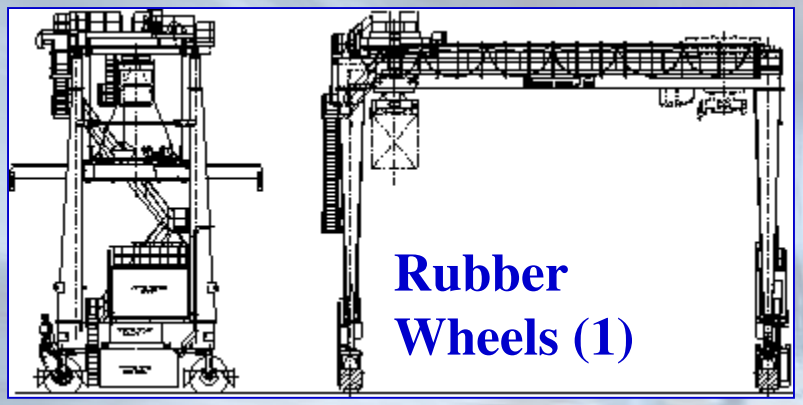
Super Post Panamax

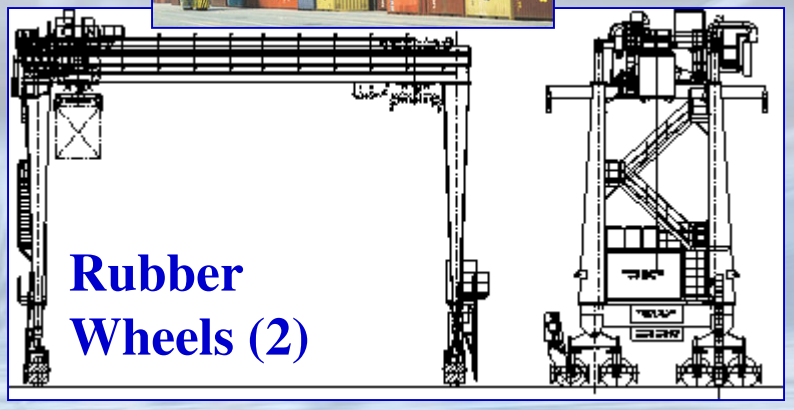
Larghezza 18-22 File
Lunghezza Asta 62m
Spreader Farest 41m

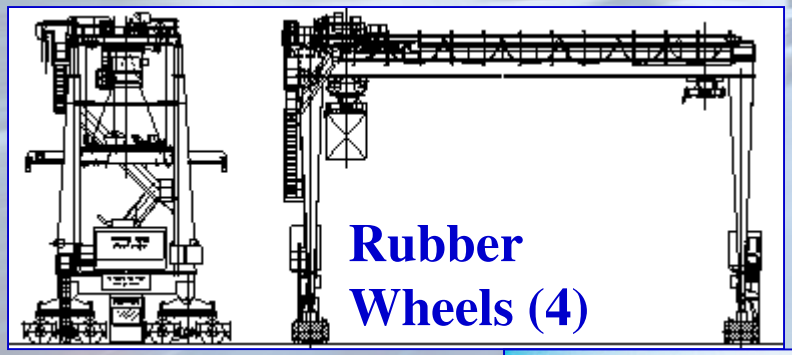
Tower Cranes

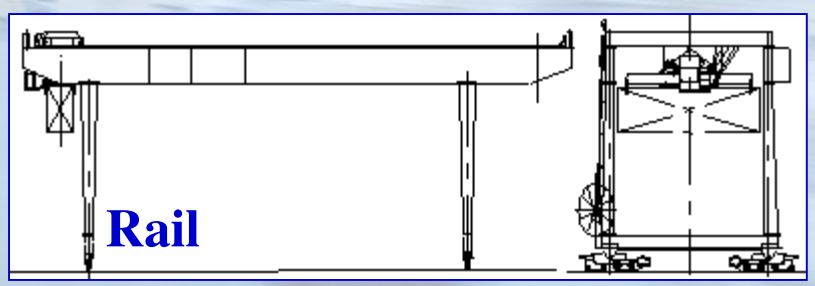
- General Purpose
- Vertical Access
- Low Productivity

Transtainers









- Vertical Access
- Medium & High Productivity
- Low Risk

Contstackers

- Reachstackers
- Contstackers

- Frontal Access
- Medium-Low Productivity
- Medium Risk

Straddle Carriers

- Straddle Carriers
- Van Carriers
- Cavalieri

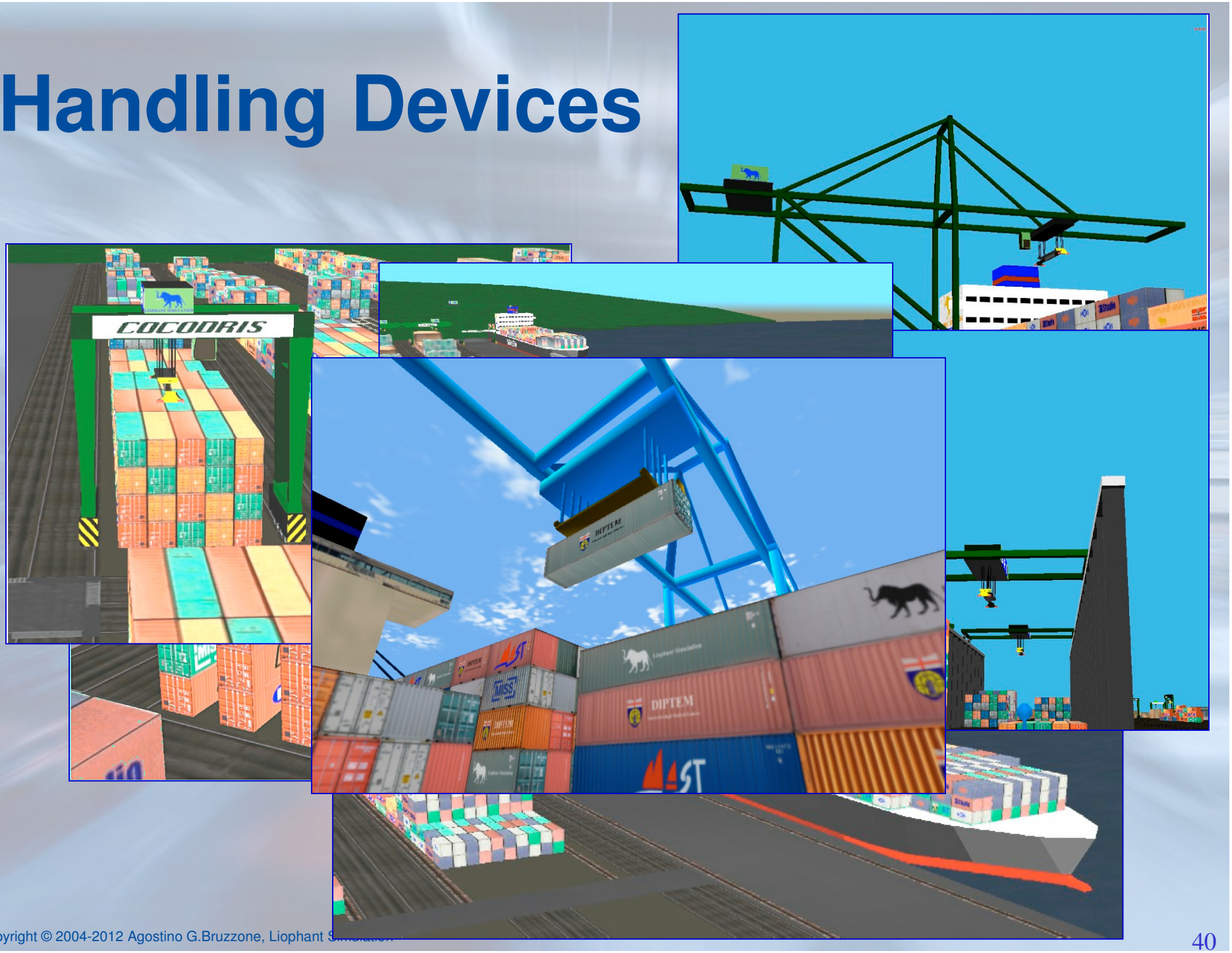
- Vertical Access with Lanes
- Medium Productivity
- HighRisk

Tractors

- Tractors/Trailers
- Ralle

- Not Autonomous
- High Speed

Handling Devices



Test?
















Next Time