

Issues in Strategic Port Management



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Outline of Presentation

- Significance of Ports
 - World Trade
 - Global Supply Chain
 - Urbanization
 - India
- Ports: Recent Developments and Challenges
- Training Programme Design

Significance of Ports: World Trade

World exports of merchandise and commercial services, 2001-2004

(Billion dollars and percentage)

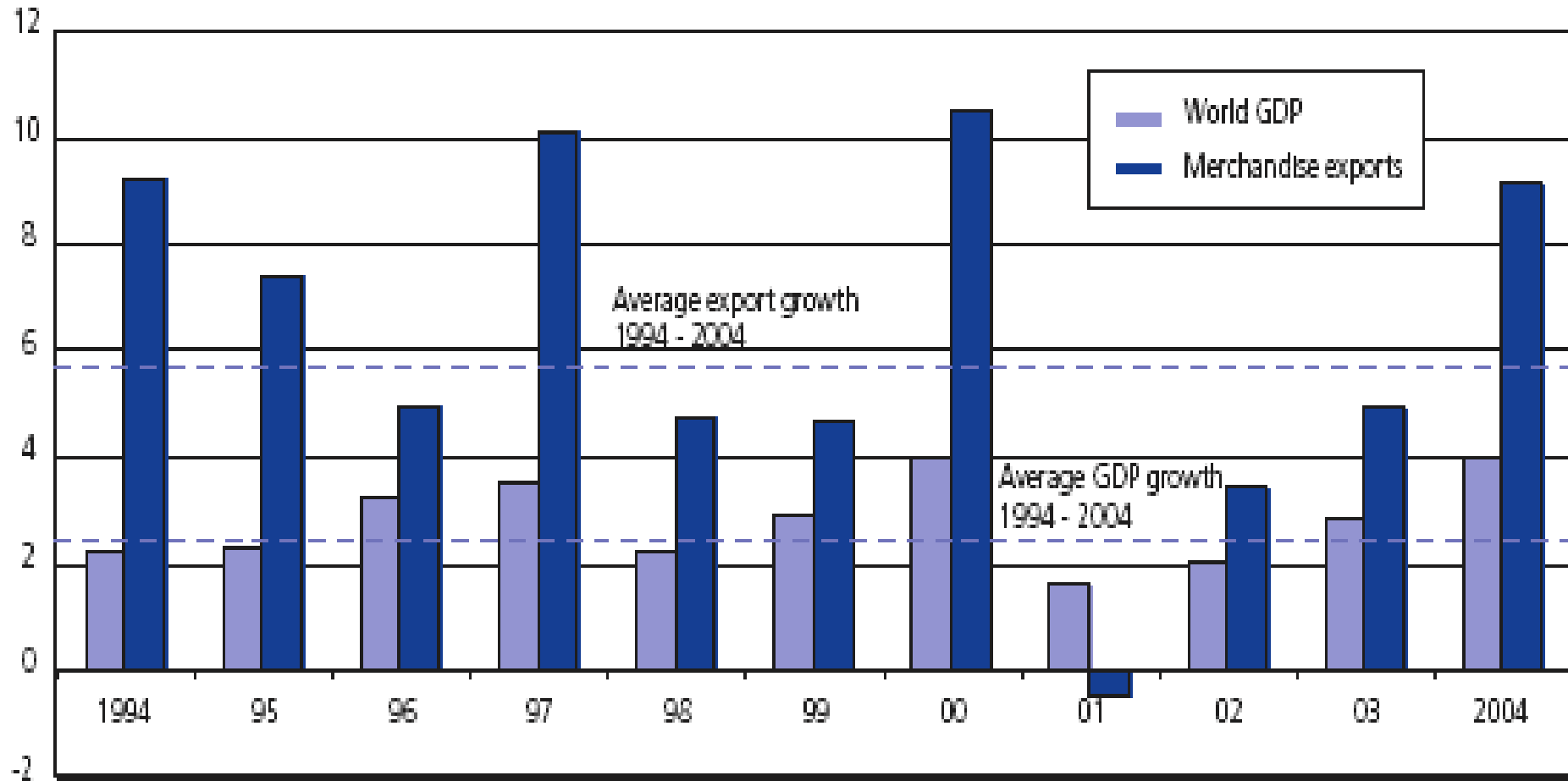
	Value	Annual percentage change			
	2004	2001	2002	2003	2004
Merchandise	8880	-4	5	17	21
Commercial services	2100	0	7	13	16

Source: WTO.

Significance of Ports: World Trade

Growth in the volume of world merchandise trade and GDP, 1994-2004

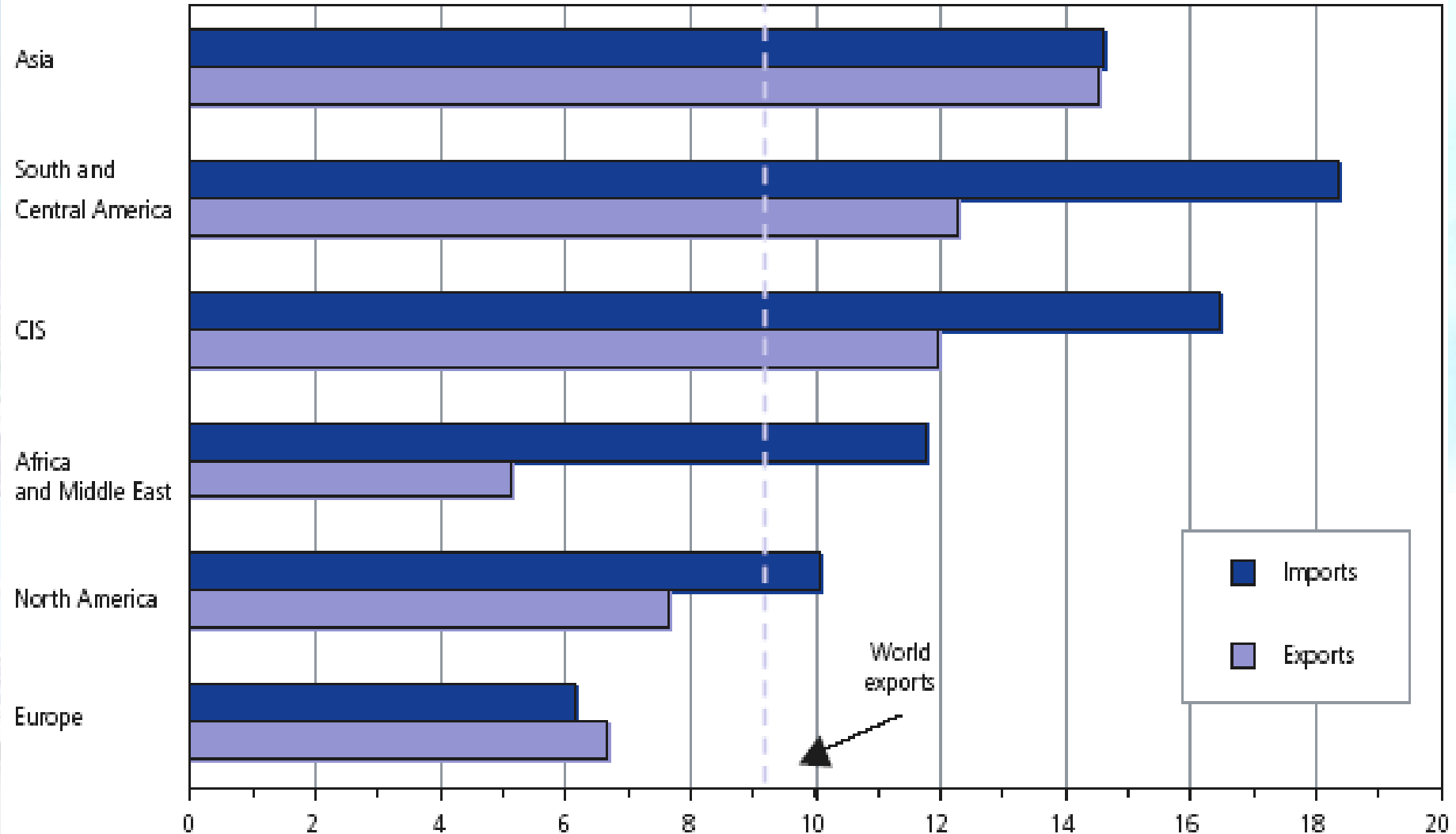
(Annual percentage change)



Source: WTO.

Significance of Ports: World Trade

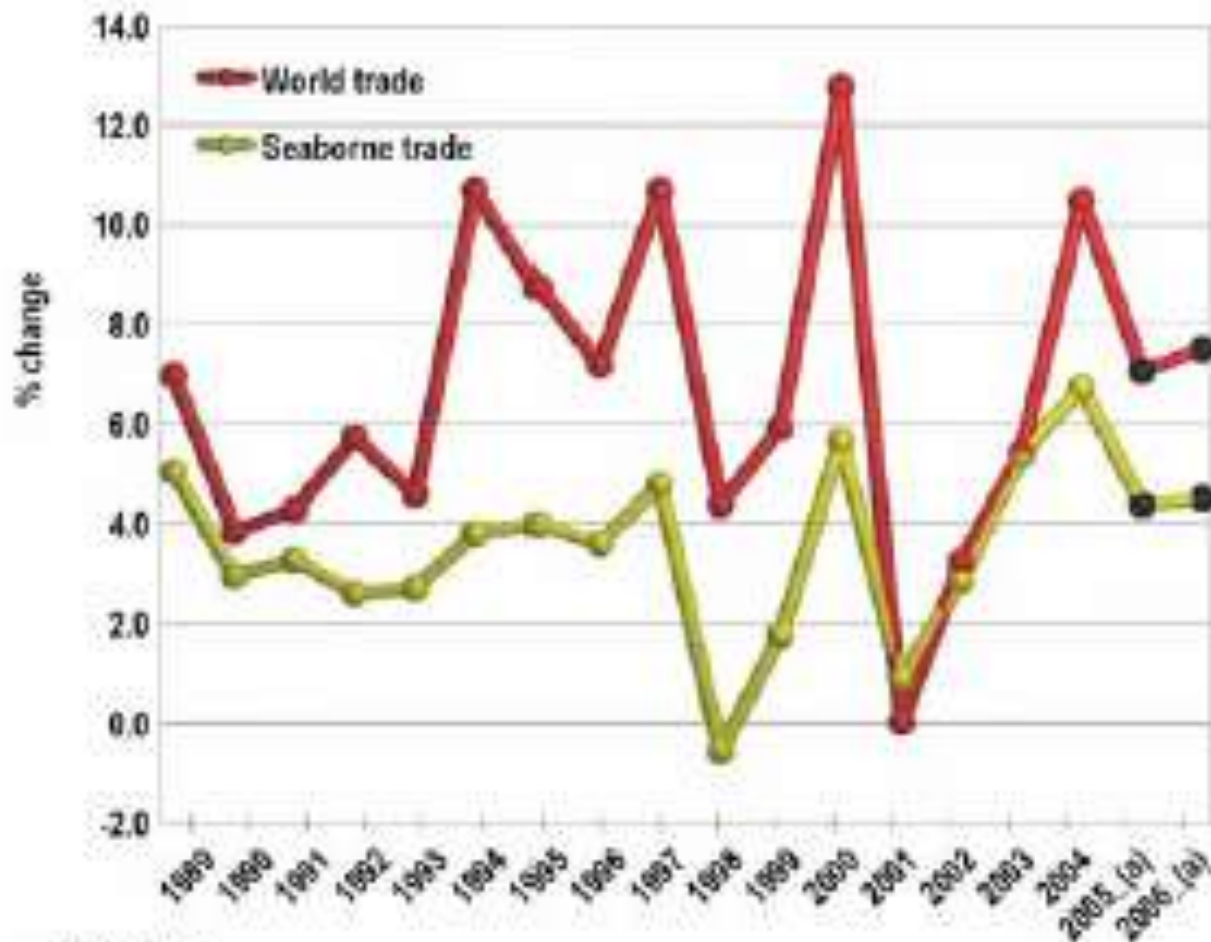
Real merchandise trade growth by region, 2004



Source: WTO.

Significance of Ports: World Trade

: World trade and world seaborne trade development 1989-2004 and forecast up to 2006 (annual percentage changes)



(a) forecast

ISL 2005; based on IMF, World Economic Outlook; and Fearnleys, Review

Significance of Ports: World Trade

- Merchandise Value: 8880 b USD
- Merchandise Tonnage: about 7.5 b tons
 - Sea: about 6.75 b tons (90%)
 - Road/Rail: about 0.75 b tons
 - Air: 0.02 b tons
- Total Port Handling (excluding domestic): about 13.5 b tons (loading – 6.75 b tons)
- About 28000 b ton miles
- About 2000 ports

Significance of Ports: World Trade

Estimates of total freight costs for imports in world trade * by country groups
(billions of dollars)

Country group	Estimate of total freight costs imports	Value of imports (c.i.f)	Freight costs as a percentage of import value
2003 World total	379.2	7 052.9	5.4
Developed market-economy countries	195.1	5 029.3	3.9
Developing countries-total	184.1	2 023.6	9.1
<i>of which in:</i>			
Africa	17.9	150.2	11.9
America	39.2	398.2	9.8
Asia	122.7	1 430.3	8.6
Europe	3.5	38.4	9.1
Oceania	0.8	6.5	12.3

Source: UNCTAD secretariat estimates based on data supplied by the IMF.

Significance of Ports: World Trade

- As proportion of import trade value (2004)
 - World 5.4%
 - Developed countries 3.9%
 - Developing countries 9.1%
 - India 12%
- Total trade

	2002	2003	2004
b tons	5.94	6.17	6.76
b ton miles	23217	24589	27635
Average lead (miles)	3909	3985	4088

Source: RMT 2005

Significance of Ports: World Trade

Year	Total Port Traffic					% of container traffic in total traffic	GR (cargo traffic)	GR (container traffic)
	Cargo Handled (mt)			Container Traffic				
	Loading	Unloading	Total	million TEU	million tons			
2000	5871.8	6249.2	12121.0	231.7	2896.3	23.9		
2001	5891.2	6167.0	12058.2	243.8	2925.6	24.3	-0.5	5.2
2002	6127.2	6334.8	12462.0	276.6	3319.2	26.6	3.3	13.5
2003	6479.5	6603.0	13082.5	303.1	3637.2	27.8	5.0	9.6
2004	6758.3	6787.1	13545.4	-	-	-	3.5	-

Source: RMT 2005



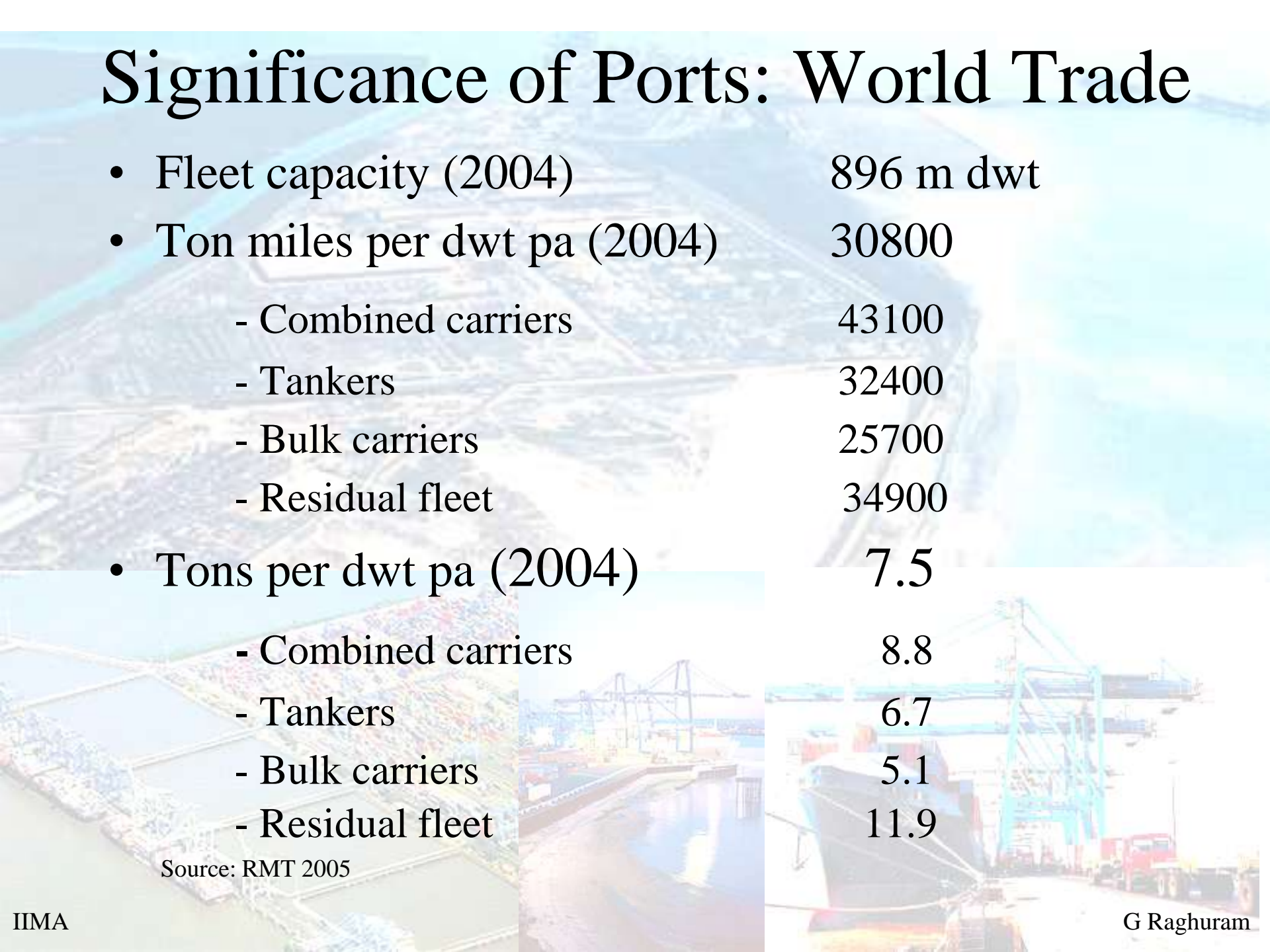
Significance of Ports: World Trade

International Output of Scheduled Airlines – 1991 to 2002

	Freight tonnes carried		Freight-tonne kilometres	
	Millions	Share of total (per cent)	Millions	Share of total (per cent)
1991	8.5	48.6	46410	79.3
1992	9.3	52.8	50750	81.0
1993	10.3	56.9	56050	81.9
1994	11.8	57.6	64700	83.8
1995	13.0	58.6	70340	84.6
1996	13.6	58.6	75510	84.7
1997	15.7	59.5	87740	85.3
1998	15.8	59.6	87050	85.5
1999	17.3	61.6	93280	85.8
2000	18.8	62.3	101520	86.1
2001	18.0	62.9	95950	86.7
2002	19.0	64.4	100590	86.2

Source: WTO

Significance of Ports: World Trade



• Fleet capacity (2004)	896 m dwt
• Ton miles per dwt pa (2004)	30800
- Combined carriers	43100
- Tankers	32400
- Bulk carriers	25700
- Residual fleet	34900
• Tons per dwt pa (2004)	7.5
- Combined carriers	8.8
- Tankers	6.7
- Bulk carriers	5.1
- Residual fleet	11.9

Source: RMT 2005

Significance of Ports: World Trade

Sr No	Ports	Cargo Handled (mt)			% Increase	% Increase
		2005	2004	2003	(03-04)	(04-05)
1	Kaohsiung	455.4	468.9	-	-	-2.9
2	Shanghai	443.0	379.0	316.2	19.9	16.9
3	Singapore	423.3	393.0	347.0	13.3	7.7
4	Rotterdam	370.2	352.4	328.2	7.4	5.1
5	Shenzhen	-	-	-	-	-
6	Busan	-	-	-	-	-
7	Hong Kong	230.1	220.9	207.6	6.4	4.2
8	Los Angeles	169.0	162.1	147.5	9.9	4.3
9	Antwerp	160.1	152.3	142.9	6.6	5.1
10	Yokohama	133.3	127.0	126.0	0.8	5.0
11	Hamburg	125.8	114.5	106.3	7.7	9.9
12	Port Klang	-	-	-	-	-
13	Dubai	-	77.4	63.6	21.6	
14	Long Beach	80.7	73.6	65.4	12.5	9.6
15	Qingdao	-	-	-	-	-
16	New York	28.1	25.5	23.5	8.5	10.4
17	Tanjung Pelepas	-	-	-	-	-
18	Bremenhaven	-	-	-	-	-
19	Laem Chabang	-	-	-	-	-
20	Gioia Tauro	-	-	-	-	-

Source: Port Authorities

Significance of Ports: World Trade Rotterdam

					mt
Year	2000	2001	2002	2003	2004
Bulk					
Crude oil	97.7	97.9	96.0	99.8	102.1
Mineral oil products	24.9	27.9	35.0	27.5	33.2
Coal	23.3	24.7	23.8	24.7	25.3
Ores and scrap	45.1	37.9	40.6	39.9	42.2
Other bulk goods	47.4	46.9	43.7	46.5	47.4
Total bulk cargo	238.4	235.3	239.1	238.6	250.2
General cargo					
Ro/Ro	10.0	9.0	9.6	10.4	11.0
Containers	65.2	62.2	65.8	70.9	82.4
Other general cargo	8.7	8.1	7.2	8.2	8.8
Total general cargo	83.9	79.3	82.7	89.5	102.2
Total	322.3	314.6	321.8	328.1	352.4
				2003	2004
Port Calls				29,377	30,695

Source: Port of Rotterdam Authority

Significance of Ports: World Trade Europe

Seaborne cargo in the major European Ports

	2003	2004	% increase
Rotterdam	328.1	352.4	7.4
Antwerp	142.9	152.3	6.6
Hamburg	106.3	114.5	7.7
Marseilles	95.5	94.1	-1.5
Le Havre	71.5	76.3	6.7
Amsterdam	65.5	73.8	12.7
Algeciras	56.8	61.3	7.9
Genoa	53.7	55.8	3.9
London	51.0	53.3	4.5
Bremen	49.0	52.3	6.7
Dunkirk	50.0	51.0	2.0
Wilhelmshaven	39.5	45.0	13.9

Source: Port Authorities

Significance of Ports: World Trade Europe

**Seaborne container traffic in the major European Ports
000 TEU**

		2003	2004	% increase
1	Rotterdam	7144	8281	15.9
2	Hamburg	6138	7003	14.1
3	Antwerp	5445	6064	11.4
4	Bremen	3191	3469	8.7
5	Gioia Tauro	3100	3261	5.2
6	Felixstowe	2650	2675	0.9
7	Algeciras	2517	2937	16.7
8	Valencia	1993	2145	7.6
9	Le Havre	1980	2150	8.6
10	Barcelona	1652	1916	16.0
11	Genoa	1606	1629	1.4
12	Piraeus	1605	1625	1.2

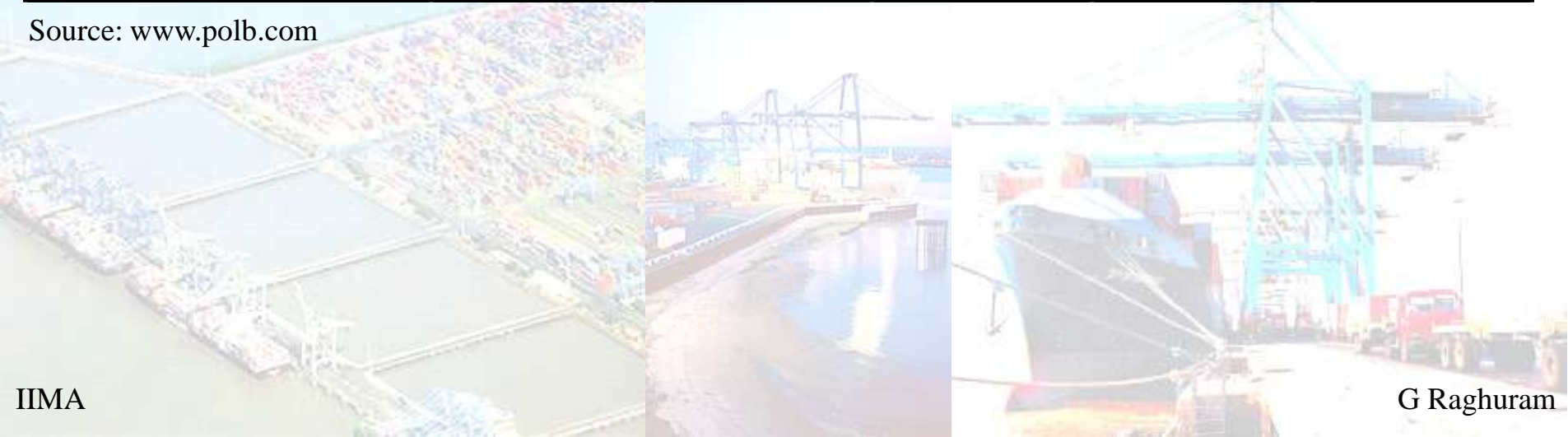
Source: Port Authorities

Significance of Ports: World Trade

Long Beach

	2001	2002	2003	2004	2005
Volume in mt	65.6	64.5	65.4	73.6	80.7
Containers in 000 TEUs	4463	4526	4658	5780	6710

Source: www.polb.com



Significance of Ports: World Trade

Singapore

					mt
	Total	Containerised	Conventional	Oil	Non Oil
1999	325.90	176.57	11.98	124.39	12.96
2000	325.59	185.86	13.72	113.33	12.68
2001	313.49	171.21	14.87	113.76	13.65
2002	335.16	183.95	14.57	120.67	15.97
2003	347.69	191.69	14.76	123.37	17.87
2004	393.42	223.50	17.38	129.33	23.21
2005	423.27	241.97	20.29	137.83	23.18

Source: www.singaporepas.com

Significance of Ports: World Trade

Hamburg

Ship Calls	2000	2001	2002	2003	2004	Diff %
Container Vessels	5866	6065	6158	6596	6870	4.2
Passenger Ships	75	263	339	227	230	1.3
Car Carriers	449	342	261	122	84	-31.1
RoRo Vessels	640	769	462	341	212	-37.8
Bulk Carriers	2329	2369	2064	2017	1989	-1.4
Other Ships	1	1	3	0	2	
LASH Carriers	23	20	14	17	10	-41.2
General Cargo Vessels	1037	1074	1031	991	870	-12.2
Liquid Bulk Carriers	1258	1441	1318	1203	1255	4.3
Total (Number)	11,678	12,344	11,650	11,514	11,522	0.1

Source: Hamburg Port Association

Significance of Ports: World Trade

Hamburg

	1990	1999	2000	2001	2002
Total (mt)	61.4	81	85.1	92.4	97.6
Liquid	32.8	37.3	36.4	39.2	37.5
Bulk	28.6	43.7	48.7	53.2	60.1
Container (in Million ton gross)	20.3	40	45.3	49.8	57.2
Number 20' Containers (in 1000 TEU)	1969	3738.2	4248.3	4688.7	5374
Containerization degree (portion of the bulk in per cent)	68.6	91.5	93.1	93.7	95.1
Source Hamburg Port Association					

Significance of Ports: World Trade

000 TEU


Top Seven World Container Ports		
	Ports	2005
1	Singapore	23192
2	Hong Kong	22602
3	Shanghai	18084
4	Shenzhen	16197
5	Busan	12521
6	Kaoshiung	9471
7	Rotterdam	9286
	Total of Above	111353

Source: Port Authorities

Significance of Ports: World Trade

- World container port traffic continued to expand at a rate of 9.6 per cent over that of 2003, reaching 303.1 million TEUs.
- Ports of developing countries handled 122.4 million TEUs, or 40.4 per cent of the total.
- In 2003, there were 57 developing countries with terminals that handled more than 100,000 TEUs.
- In 2004, the top 20 world container ports handled 166.6 million TEUs.

Significance of Ports: Global Supply Chain



- **SCM: New Focus Area**
- **Integration from Point of Production to Point of Consumption**
- **Logistics: A Key Function**
- **Transportation: A Critical Activity**
- **Ports: A Significant Inter-modal Facilitator**

Significance of Ports: Urbanization

- Ports traditionally have led to urbanization
- Concept of a port on this front has changed
- Zoning of port area is critical



Significance of Ports: India

- 95% of international trade by volume is by sea
- 77% of above trade by value is by sea
- 12% of seaborne import value is freight (2003)
- Freight bill of seaborne import trade about Rs 400 b pa (2003)
- 12 major port administrations (including JNPT and Ennore)
- 184 minor and intermediate Ports (44 under GMB)
- About 567 mt traffic (423 mt at major ports and 144 mt at minor/other ports) in 2005-06

Sea Ports in India



- State Capital
- 🚢 Major Seaport
- ➔ Additional Coastal Ports

Map not to Scale

Significance of Ports: India

Trade	Exports (m US\$)	Imports (m US\$)
1998-99	33,210	42,378
1999-00	36,759	49,798
2000-01	44,400	49,720
2001-02	43,976	51,588
2002-03	52,856	61,572
2003-04	63,622	77,237
CAGR (%)	13.9	12.8

Source: INSA 2004, INSA 2003

Significance of Ports: India

	Average Lead (km)	Rate (per tkm)
Ship (2002-03)	6400	35 ps
Rail (2003-04)	689	72 ps
Road	NA	100-150 ps

Source: INSA 2004
IR Yearbook 2003-04

Significance of Ports: India

	Traffic Handled in 2005-06 (mt)	Traffic Handled in 2004-05 (mt)	Traffic Handled in 2003-04 (mt)	Traffic Handled in 2002-03 (mt)
Major Ports	423.4	383.6	344.8	313.5
GMB	108.0	97.1	89.4	84.1
Other Minor Ports	36.0	30.0	25.6	21.0
Total Traffic	567.4	510.7	459.8	419.0

Source: IPA



Significance of Ports: India

Sr No	Port	Cargo in 05-06 (mt)	Cargo in 04-05 (mt)	Cargo in 03-04 (mt)	Growth Rate (%) 03-04 to 04-05	Growth Rate (%) 04-05 to 05-06
1	Visakhapatnam	55.8	50.1	47.7	5.0	11.4
2	Kolkata (incl Haldia)	53.0	46.2	41.3	11.9	14.7
3	Chennai	47.3	43.8	36.7	19.3	7.9
4	Kandla	45.9	41.5	41.5	0.0	10.6
5	Mumbai	44.0	35.1	30.0	17.0	25.4
6	JNPT	37.7	32.8	31.2	5.1	14.9
7	New Mangalore	34.4	33.9	26.7	27.0	1.5
8	Mormugao	31.7	30.7	27.9	10.0	3.2
9	Paradip	33.1	30.1	25.3	19.0	10.0
10	Tuticorin	17.1	15.8	13.7	15.4	8.2
11	Cochin	13.9	14.1	13.6	3.7	-1.4
12	Ennore	9.1	9.5	9.3	1.9	-4.0
	Total	422.9	383.6	344.9	11.2	10.3

Source: IPA

Significance of Ports: India

No	Port	State	Cargo in 05-06 (mt)	Cargo in 04-05 (mt)	Cargo in 03-04 (mt)	% Increase (04-05 to 05-06)
1	Visakhapatnam (M)	A.P.	55.8	50.0	47.7	11.6
2	Kolkata (incl Haldia) (M)	W.B.	53.0	43.8	41.3	21.0
3	Sikka	Gujarat	52.1	51.5	49.8	1.2
4	Chennai (M)	T.N.	47.2	41.5	36.7	13.6
5	Kandla (M)	Gujarat	45.9	46.0	41.5	-0.2
6	Mumbai (M)	Maharashtra	44.0	33.9	30.0	29.8
7	JNPT (M)	Maharashtra	37.7	35.1	31.2	7.3
8	New Mangalore (M)	Karnataka	34.4	30.7	26.7	12.1
9	Mormugao (M)	Goa	31.7	32.8	27.9	-3.4
10	Paradip (M)	Orissa	33.1	30.1	25.3	10.0

Source: IPA

Significance of Ports: India

Sr No	Port	State	Cargo in 05-06 (mt)	Cargo in 04-05 (mt)	Cargo in 03-04 (mt)	% Increase (04-05 to 05-06)
11	Tuticorin (M)	T.N.	17.1	15.8	13.7	8.2
12	Cochin (M)	Kerala	13.9	14.1	13.6	-1.4
13	Kakinada	A.P.		12.2	6.8	
14	Magdalla	Gujarat	13.3	11.6	10.8	14.7
15	Ennore (M)	T.N.	9.1	9.5	9.3	-4.0
16	Panjim	Goa	11.8	8.5	8.4	38.8
17	Dharamtar	Maharashtra		7.7	6.7	
18	Dahej	Gujarat		6.5	3.9	
19	GAPL	Gujarat	8.1	6.0	4.5	35.0
20	Jafrabad	Gujarat	4.3	4.6	4.5	-6.5

Source: IPA

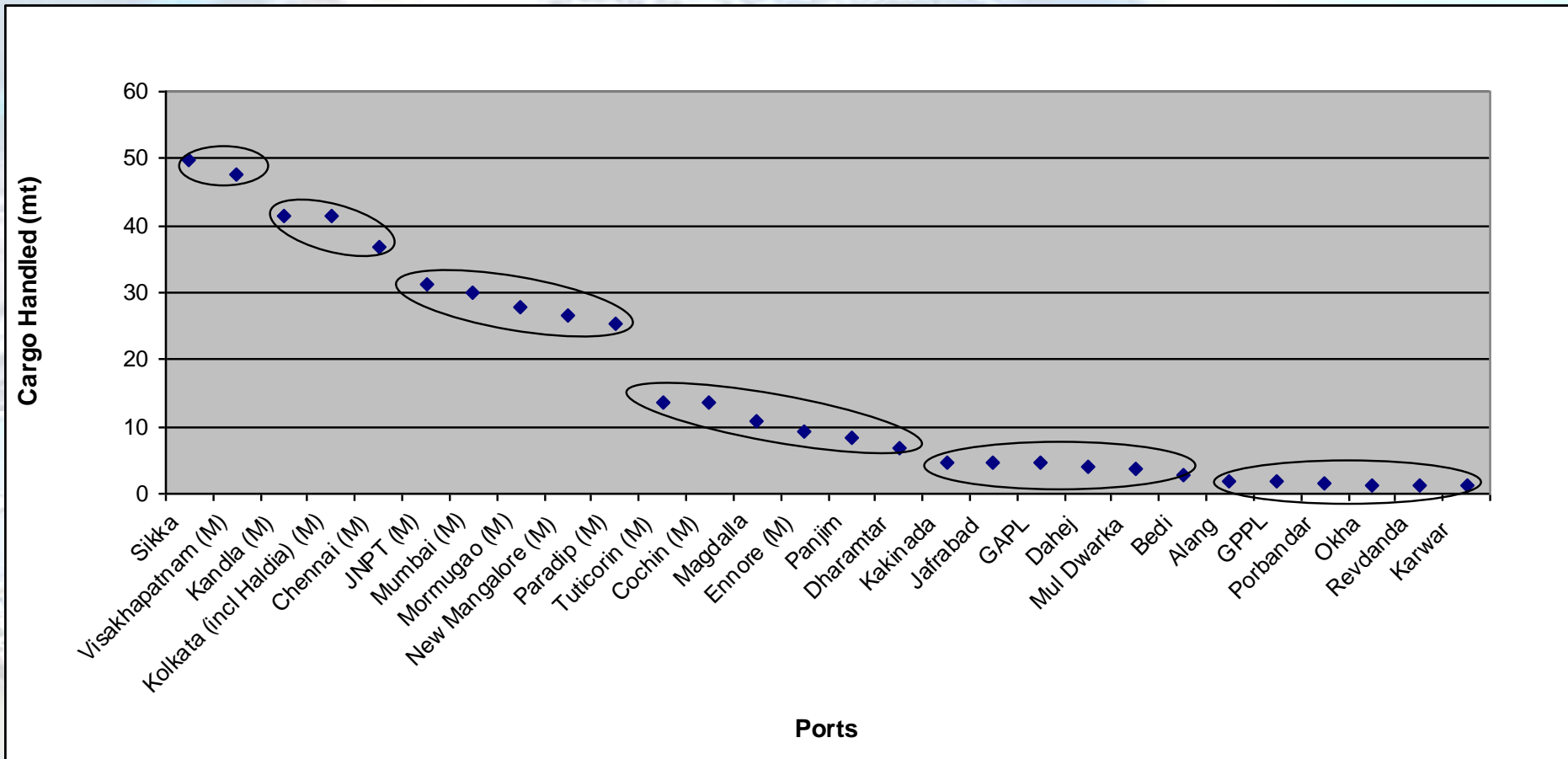
Significance of Ports: India

No	Port	State	Cargo in 05-06 (mt)	Cargo in 04-05 (mt)	Cargo in 03-04 (mt)	% Increase (04-05 to 05-06)
21	Mul Dwarka	Gujarat	3.8	3.9	3.8	-2.6
22	Bedi	Gujarat	4.4	3.2	2.9	37.5
23	Karwar	Karnataka		2.5	1.0	
24	Porbandar	Gujarat	2.0	2.3	1.5	-13.0
25	GPPL	Gujarat	1.9	2.0	1.9	-5.0
26	Okha	Gujarat	1.2	1.4	1.2	-14.3
27	Revdanda	Maharashtra		1.3	1.2	
28	Navlaki	Gujarat	1.8	1.3	0.8	45.6
29	Jakhau	Gujarat	0.8	1.2	1.1	-33.3
30	Ulwa-Belap	Maharashtra		1.0	0.9	

Source: IPA

Significance of Ports: India

Cargo Handled at Indian Ports (2003-04)



Source: IPA

Significance of Ports: India

	2004-05			
	Major Ports	GMB	Other Minor Ports	Total
Export/Import	294.9	76.0	20.5	391.4
Coastal	88.8	21.1	11.6	121.5
Total	383.7	97.1	32.1	512.9

Source: IPA



Significance of Ports: India

Year	Total Traffic at Indian Ports (mt)	
	Projected*	Actual
1999-00	346	331
2000-01	389	365
2001-02	435	383
2002-03	484	419
2003-04	540	460
2004-05	595	513
2005-06	653	567

* Rakesh Mohan Committee Report, 1996

CAGR between 1990-00 and 2005-06 is 6.5%.

Significance of Ports: India

Portwise Container Traffic

2005-06 ('000 TEUs)

	Port		%
1	JNPT	2668	57.82
2	Chennai	734	15.91
3	Tuticorin	321	6.96
4	Mumbai	156	3.38
5	Cochin	203	4.40
6	Kandla	149	3.23
7	Calcutta	203	4.40
8	Haldia	110	2.38
9	Visakhap	47	1.02
10	Mornmug	10	0.22
11	New Man	10	0.22
12	Paradip	3	0.07
13	Ennore	0	0.00
	Total	4614	100.00

Source: IPA

Significance of Ports: India

Container Traffic in Indian vs World Ports

(000 TEUs)

Top Seven Indian Container Ports			Top Seven World Container Ports	
	Ports	2005-06	Ports	2005
1	JNPT	2668	Singapore	23192
2	Chennai	734	Hong Kong	22602
3	Tuticorin	321	Shanghai	18084
4	Kolkata/Haldia	313	Shenzhen	16197
5	Cochin	203	Busan	12521
6	Mumbai	156	Kaoshiung	9471
7	Kandla	148	Rotterdam	9286
	Total of Above	4543	Total of Above	111353

Source: IPA, Port Authorities

Significance of Ports: India

Cost of Congestion (2004-05)

No of port calls : 18,222
Avg turnaround time : 3.4 days
International 'good' avg : 1.0 days

Extra time in India per
port call : 2.4 days

No of ship days lost : 43,733

Significance of Ports: India

Cost of Congestion (2004-05)

43,733 Ship days

@ \$10,000/day

\$437.3 mn

≈ Rs 19.2 bn/year

(@ Rs 44/\$)

Net foreign exchange
earnings of shipping

: Rs 36.5 bn/year

(2002-03)

(excluding cost of buying ships)

Repatriated earnings
of 'shippees'

: Rs 10 bn/year

Ports: Recent Developments and Challenges

- **Significant Growth of Maritime Transport**
- **Continued Increase in Ship Size**
- **Mergers and Alliances of Shipping Companies**
- **Emergence of international terminal operators doing their business at multiple ports on a global basis**
- **Increasing Involvement of Private Sectors in Ports**
 - **Privatized services:** handling equipment at container and break bulk terminals, services such as pilotage, stevedoring, towage, ship agents, land transport and other shipping services
 - provision of port services has been **shifting from the public port authority to private sector** for improved efficiency of port operations

Ports: Recent Developments and Challenges

- The public port authority will focus more on
 - **landlord function** such as long-term planning, infrastructure development, asset management
 - **regulatory function** such as maritime safety, environment protection and fair competition, and
 - **co-ordination function** such as coordination among governmental agencies, maritime organizations, decision-making authorities and planners of the city, under the commonly shared long- range policy and planning
 - **facilitation/promotion function** such as provision of port EDI, inter-port cooperation and strategic marketing.

Ports: Recent Developments and Challenges

- Ports as Logistic Centers
 - Hubs/centers for global logistics system
 - Value adding center in logistics system
- Ports in IT Age
- Diversified and Innovative Partnerships
 - Public and private sectors in port
 - Port and its users
 - Port authority and terminal operators
 - Partnerships with logistics providers, transport providers
 - Inter-port co-operation, port alliance and mergers
- Port Corporatization
 - More flexibility and speed in port management and development (planning and decision making)

Ports: Recent Developments and Challenges

- Provide Efficient and Effective Port Services
 - Market Profiling
 - Distance based
 - Customer based
 - Commodity based
 - Operations
 - Improving ship turn around
 - Improving cargo turn around
- Improve Safety and Security
- Environmental Concerns

Ports: Recent Developments and Challenges

Customer

Changing from fragmented approach by respective players to integrated logistics system to better meet individual needs of customers





THANK YOU

