Freight Business Opportunities for Indian Railways

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Background Information on IR

Asia’s largest and world’s second largest (after United States) system under single management

Route length: more than 63,000 km

Key operations: transportation of freight and passengers

Freight traffic: seven main bulk commodities, and other commodities including containers

Freight Traffic: Modal Split

Mode	1998-99		2002-03		2003-04		2005-06	
	BTKM	% Share	BTKM	% Share	BTKM	% Share	BTKM	% Share
Road	449	51.7	655	55.2	694	54.1	839	56.3
Rail	284	32.7	356	30.0	384	30.0	440	29.6
Pipeline (max)	70	8.1	80	6.7	86	6.7	90	6.0
Coastal	66	7.6	96	8.1	118	9.2	120	8.1
Total	869	100.0	1187	100.0	1282	100.0	1489	100.0

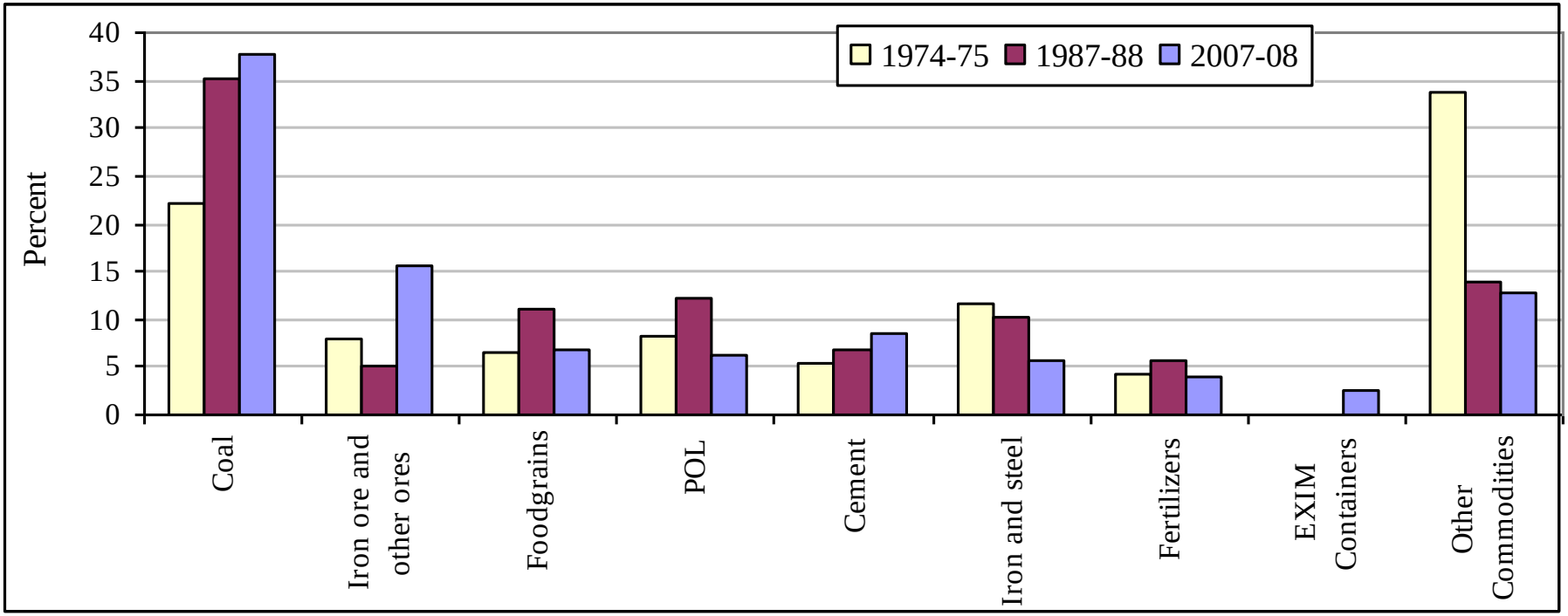
Air is a maximum of 0.14 btkms

Total Transport System Study
RITES, 2009

Mode	2005-06 (by GR)		2007-08 (RITES)	
	BTKM	% Share	BTKM	% Share
Road	839	56.3	773	52.4
Rail	440	29.6	513*	34.8
Pipeline (max)	90	6.0	100	6.8
Coastal	120	8.1	86	5.8
IWT	negligible	-	3	0.2
Total	1489	100.0	1475	100.0

*As per IR, this is 523

Commodity-wise Freight Earnings



Freight Traffic Profile in Railways

2007-08

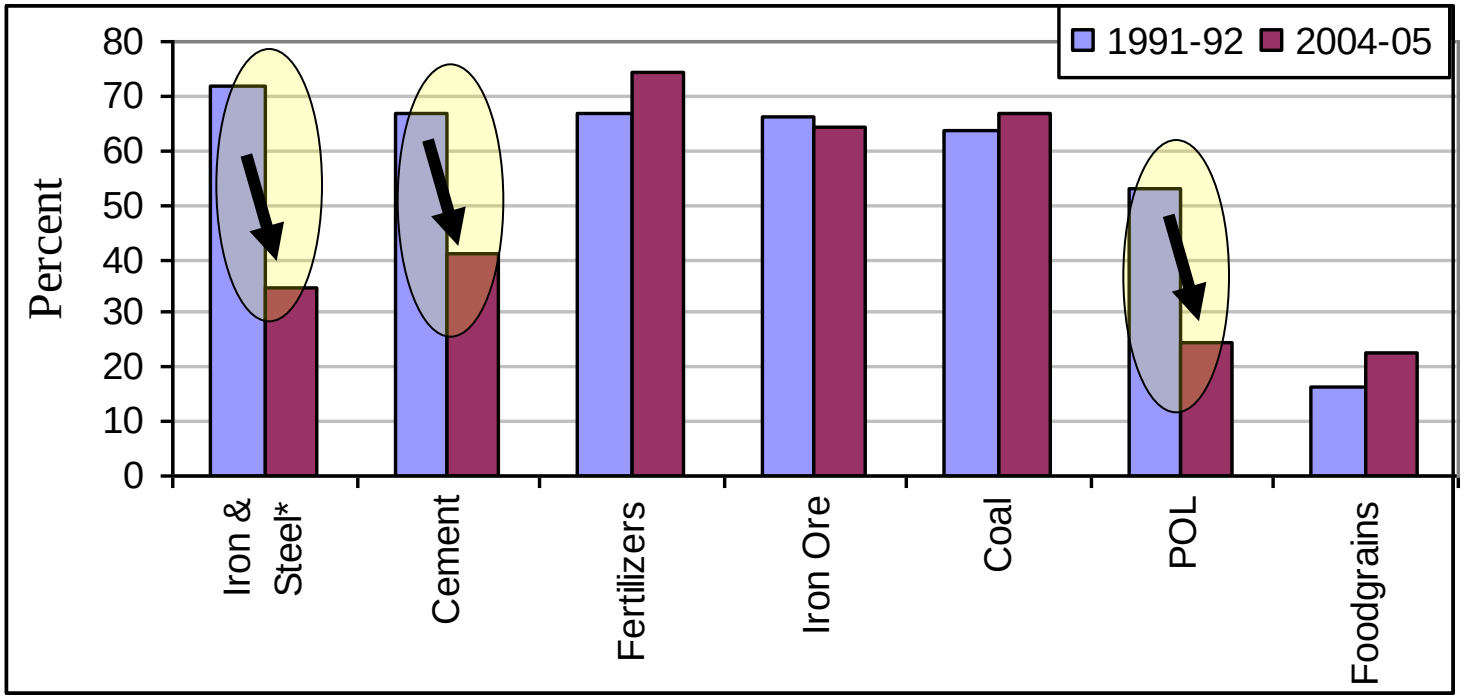
		Originating Tons (m)	%	Rs Crores	%
Freight	Bulk	724	91.1	41,426	89.2
	Non-Bulk	70	8.9	4,999	10.8
	Total	794	100.0	46,425	100.0

Source: Indian Railways Year Book 2007-08

Market Share of Freight Traffic

Market share in
1951: 89%
2001: 40%

Competition by other modes
Shortcomings in IR's freight policies



[Source: MOR, Various Years, Year Book; *MOR, 2002, Status Paper]

Initiatives by IR

- Rationalization of freight tariff structure
- Incentives to premier customers
- Higher freight concessions to attract short lead traffic
- Computerization of freight movement through Freight Operations Information System (FOIS)
- Warehousing facilities through CWC and private freight terminals
- Focus on improving port connectivity and inter-modal transport

Freight Incentive Schemes

1. **Volume Growth Incentive Schemes** (for promoting higher volumes in lean season)

2. **Cargo Aggregation Schemes** (for cargo not suitable for block rake movement due to insufficient volume)

3. **Consignment Volume Based Schemes** (tariff rates and options based on consignment volume)

Freight Circulars Issued

Year	No of Freight Rates Circulars Issued	
	Total Notifications	Rates Circulars
2009 (till August 31)	83	51
2008	140	84
2007	149	111
2006	123	114
2005	81	76
2004	58	55
2003	37	35

Production and Railway Loading Growth

In Percent

	Production Growth (1991-92 to 2003-04)	Railway Loading Growth (1991-92 to 2003-04)	Production Growth (2003-04 to 2005-06)	Railway Loading Growth* (2003-04 to 2005-06)	Production Growth (2004-05 to 2005-06)	Railway Loading Growth* (2004-05 to 2005-06)
Low Rated Commodities						
Coal	3.61	4.25	**5.6**[1]	**8.1**		8.4
Food Grains	1.22	4.24		-3.3		-10.9
High Rated commodities						
Cement	7.86	4.37	11.7	11.4	**9.3**	**13.7**
POL	8.02	2.88	4.7[1]	2.9		5.6
Iron & Steel	8.28	1.09	6.0[2]	8.1	**7.4**	**12.2**

[Source: CRISIL, 2005; CMA, 2006; MOS, 2006; MOPNG, 2006; *MOR, Internal Correspondence;]

Framework for market segmentation:

Origin-Destination (OD) Perspective

Originating Loading (2005-06)

Division	Originating Loading (2005-06) (mt)	Growth over 2004-05	Share in IR's Traffic	Major Commodities
Bilaspur	71.2	5.4	10.7	Coal
Dhanbad	59.8	6.7	9.0	Coal
Chakradharpur	57.6	21.0	8.6	Iron ore, Steel
Secunderabad	40.4	10.8	6.0	Coal, Cement
Asansol	37.9	13.9	5.7	Coal, Steel
Waltair	36.8	8.8	5.5	Iron ore, Steel
Originating loading of six divisions	304	12.1	45.5	
Originating loading of IR of 67 Divisions	668	10.7	100.0	

[Source: Murty, Uppuluri Krishna, 2006]

Market Segmentation

Total Traffic: 887.8 mt (2009-10)

mt

	Industry 495.8		Port 80.7		Distribution Centre 311.3	
Industry/Collection Centre 285.1			EXIM Containers POL **Total**	8.5 6.8 **15.4**	Cement Foodgrains Fertilisers Iron and Steel POL Domestic Containers Salt Sugar Other Commodities **Total**	93.2 38.2 33.0 29.8 20.5 9.6 4.8 4.0 36.8 **269.7**
Mine 478.9	Coal Iron ore & other ores Limestone and dolomite Stones (excl marble) Gypsum **Total**	305.7 81.6 14.8 7.5 4.0 **413.5**	Iron ore & other ores Coal **Total**	50.3 15.1 **65.3**		
Port 123.8	Coal Other Commodities Iron ore & other ores **Total**	75.4 6.0 0.9 **82.2**			EXIM Containers POL Fertilisers Iron and Steel Foodgrains **Total**	16.8 11.6 10.7 2.1 0.5 **41.6**

Source: Raghuram and Rachna Gangwar, 2009

OD Perspective (2007-08)

Total Traffic: 793.9 mt

mt

O \ D	Industry (444.0)	Ports (88.0)	Distribution Centres (261.9)
Industry/ Collection Centres (247.8)			
Mines (457.1)			
Ports (89.0)			

[Source: Raghuram and Gangwar, 2009]

OD Perspective (2007-08)

Total Traffic: 793.9 mt

mt

O \ D	Industry (444.0)	Ports (88.0)	Distribution Centres (261.9)
Industry/ Collection Centres (247.8)		Containers (20.0) POL (6.5) **Total (26.5)**	Cement (79.0) Foodgrains (37.6) Fertilisers (26.8) Iron and steel (24.3) Other commodities (23.5) POL (19.6) Sugar (6.0) Salt (4.6) **Total (221.3)**
Mines (457.1)	Coal (280.9) Iron ore/other ores (89.9) Limestone/dolomite (14.1) Stones, excl marble (7.4) Gypsum (3.3) **Total (395.6)**	Iron ore/other ores (46.2) Coal (15.4) **Total (61.5)**	
Ports (89.0)	Coal (40.6) Other commodities (7.2) Iron ore/other ores (0.7) **Total (48.5)**		Containers (19.5) POL (9.8) Fertilisers (9.1) Iron and steel (1.5) Foodgrains (0.7) **Total (40.6)**

[Source: Raghuram and Gangwar, 2009]

OD Perspective (2006-07)

Total Traffic: 727.8 mt

mt

O \ D	Industry (411.3)	Ports (78.3)	Distribution Centres (238.2)
Industry/ Collection Centres (224.5)		Containers (16.4) POL (5.6) **Total (22.0)**	Cement (73.1) Foodgrains (39.0) Fertilisers (27.2) Iron and steel (25.5) POL (17.2) Other commodities (12.2) Salt (4.6) Sugar (3.7) **Total (202.5)**
Mines (424.1)	Coal (261.5) Iron ore/other ores (80.3) Limestone/dolomit (12.7) e Stones, excl (10.0) marble Gypsum (3.2) **Total (367.8)**	Iron ore/other ores (40.9) Coal (15.4) **Total (56.3)**	
Ports (79.1)	Coal (36.4) Other commodities (6.6) Iron ore/other ores (0.5) **Total (43.5)**	-	Containers (15.3) POL (8.9) Fertilisers (7.1) Foodgrains (2.8) Iron and steel (1.6) **Total (35.7)**

[Source: Raghuram and Gangwar, 2008]

OD Perspective (2005-06)

Total Traffic: 666.5 mt

mt

O \ D	Industry (382.1)	Ports (74.1)	Distribution Centres (210.3)
Industry/ Collection Centres (198.9)		Containers (13.5) POL (4.9) **Total (18.4)**	Cement (61.2) Foodgrains (41.4) Fertilisers (26.8) Iron and steel (20.1) POL (20.0) Other commodities (4.7) Salt (3.5) Sugar (2.8) **Total (180.5)**
Mines (398.8)	Coal (245.6) Iron ore/other ores (72.8) Limestone/dolomit (12.0) e Stones, excl (10.1) marble Gypsum (2.7) **Total (343.1)**	Iron ore/other ores (40.4) Coal (15.3) **Total (55.7)**	
Ports (68.9)	Coal (33.3) Other commodities (5.4) Iron ore/other ores (0.4) **Total (39.0)**	-	Containers (13.5) POL (8.5) Fertilisers (5.9) Foodgrains (1.7) Iron and steel (0.3) **Total (29.8)**

[Source: Raghuram and Gangwar, 2007]

OD Perspective (2004-05)

Total Traffic: 602.1 mt

mt

O \ D	Industry (337.3)	Ports (70.7)	Distribution Centres (194.1)
Industry/ Collection Centres (186.1)		Containers (12.3) POL (4.2) **Total (16.5)**	Cement (53.8) Foodgrains (46.2) Fertilisers (24.9) Iron and steel (19.9) POL (17.4) Other commodities (4.2) Salt (2.1) Sugar (1.1) **Total (169.6)**
Mines (357.2)	Coal (224.9) Iron ore/other ores (57.9) Limestone/dolomit (10.0) e Stones, excl (8.0) marble Gypsum (2.2) **Total (303.0)**	Iron ore/other ores (38.1) Coal (16.2) **Total (54.3)**	
Ports (58.8)	Coal (29.3) Other commodities (4.7) Iron ore/other ores (0.3) **Total (34.3)**	-	Containers (11.5) POL (7.8) Fertilisers (3.9) Foodgrains (1.0) Iron and steel (0.3) **Total (24.5)**

[Source: Raghuram and Gangwar, 2006]

Mine to Industry

Traffic	**395.6 mt in 2007-08 (49.8% of IR's Traffic)** 303.0 mt in 2004-05 (50.3% of IR's Traffic)
Commodities	Coal (71%), Iron Ore/ Other Ores, Limestone/ Dolomite, Stones, Gypsum
Attributes	
Product	**Door to door service,** capacity, scope for terminal automation, full rake and seamless loading/unloading, increased axle loading, service contracts for rake circuit movements, special purpose wagons, weigh bridges
Price	Can charge high upto what the market can bear
Promotion	To shift possible movements into the slack season from the peak season, to help use returning empty rakes
Place	At mines and industries

Industry to Distribution Centre

Traffic	**221.3 mt in 2007-08 (27.9% of IR's Traffic)** 169.6 mt in 2004-05 (28.2% of IR's Traffic)
Commodities	Cement, Foodgrains, Fertilizers, POL, Iron & Steel, Salt, Sugar, Other Commodities
Attributes	
Product	Timely wagon availability, automation at origin and destination, reliable delivery, distribution centre infrastructure and operation, integration with movement beyond distribution centre, multi-modal services, information on wagon tracking
Price	Competitive, could be customized for seasons and specific ODs
Promotion	To encourage trial
Place	Industries, distribution centers and beyond

Mine to Port

Traffic	**61.5 mt in 2007-08 (7.7% of IR's Traffic)** 54.3 mt in 2004-05 (9.0% of IR's Traffic)
Commodities	Iron Ore/ Other Ores, Coal
Attributes	
Product	**Door to door service,** capacity, scope for terminal automation, full rake and seamless, loading/unloading, increased axle loading, service contracts for rake circuit movements, special purpose wagons, weigh bridges
Price	•Can charge high upto what the market can bear •Needs to be competitive where coastal shipping is in competition
Promotion	To shift possible movements into the slack season from the peak season, to help use returning empty rakes
Place	At mines and ports

Port to Industry

Traffic	**48.5 mt in 2007-08 (6.1% of IR's Traffic)** 34.3 mt in 2004-05 (5.7% of IR's Traffic)
Commodities	Coal, Other Commodities, Iron Ore/ Other Ores
Attributes	
Product	**Door to door service,** capacity, scope for terminal automation, full rake and seamless, loading/unloading, increased axle loading, service contracts for rake circuit movements, special purpose wagons, weigh bridges
Price	Can charge high upto what the market can bear
Promotion	To encourage trial
Place	At ports and industries

Port to Distribution Centre

Traffic	**40.6 mt in 2007-08 (5.1% of IR's Traffic)** 24.5 mt in 2004-05 (4.1% of IR's Traffic)
Commodities	Containers, POL and Fertilizers
Attributes	
Product	**Door to door service,** capacity, scope for terminal automation, full rake and seamless, loading/unloading, increased axle loading, service contracts for rake circuit movements, special purpose wagons, weigh bridges
Price	Can charge high upto what the market can bear
Promotion	To encourage trial
Place	At ports and industries

Industry/Collection Centre to Port

Traffic	**26.5 mt in 2007-08 (3.3% of IR's Traffic)** 16.4 mt in 2004-05 (2.7% of IR's Traffic)
Commodities	Containers and POL
Attributes	
Product	**Door to door service,** capacity, scope for terminal automation, full rake and seamless, loading/unloading, increased axle loading, service contracts for rake circuit movements, special purpose wagons, weigh bridges
Price	Can charge high upto what the market can bear
Promotion	To encourage trial
Place	At ports and industries

Potential Clients of IR (2007-08)

Clients	Origins (mt)	Destinations (mt)	Total (mt)	Total (%)
Industries	247.8	444.0	691.8	43.6
Mines	457.1	-	457.1	28.8
Distribution Centres	-	261.9	261.9	16.5
Ports	89.0	88.0	177.0	11.1
Total	793.9	793.9	1587.8	100.0

Potential Clients of IR (2004-05)

Clients	Origins (mt)	Destinations (mt)	Total (mt)	Total (%)
Industries	186.1	337.3	523.4	43.4
Mines	357.2	-	357.2	29.7
Distribution Centres	-	194.1	194.1	16.1
Ports	58.8	70.7	129.5	10.8
Total	602.1	602.1	1204.2	100.0

Potential Clients of IR (2007-08)

Mines (395.6 mt; 89.1%)

Ports (48.5 mt; 10.9%)

Destination (444.0 mt; 64.2%)

Industry (691.8 mt; 43.6% of IR traffic)

Origin (247.8 mt; 35.8%)

Distribution Centre (221.3 mt; 89.3%)

Ports (26.5 mt; 10.7%)

Potential Clients of IR (2004-05)

Mines (303.0 mt; 89.8%)

Ports (34.3 mt; 10.2%)

Destination (337.3 mt; 64.5%)

Industry (523.3 mt; 43.4% of IR traffic)

Origin (186.0 mt; 35.5%)

Distribution Centre (169.6 mt; 91.2%)

Ports (16.4 mt; 8.8%)

Thank You

Location of SEZs

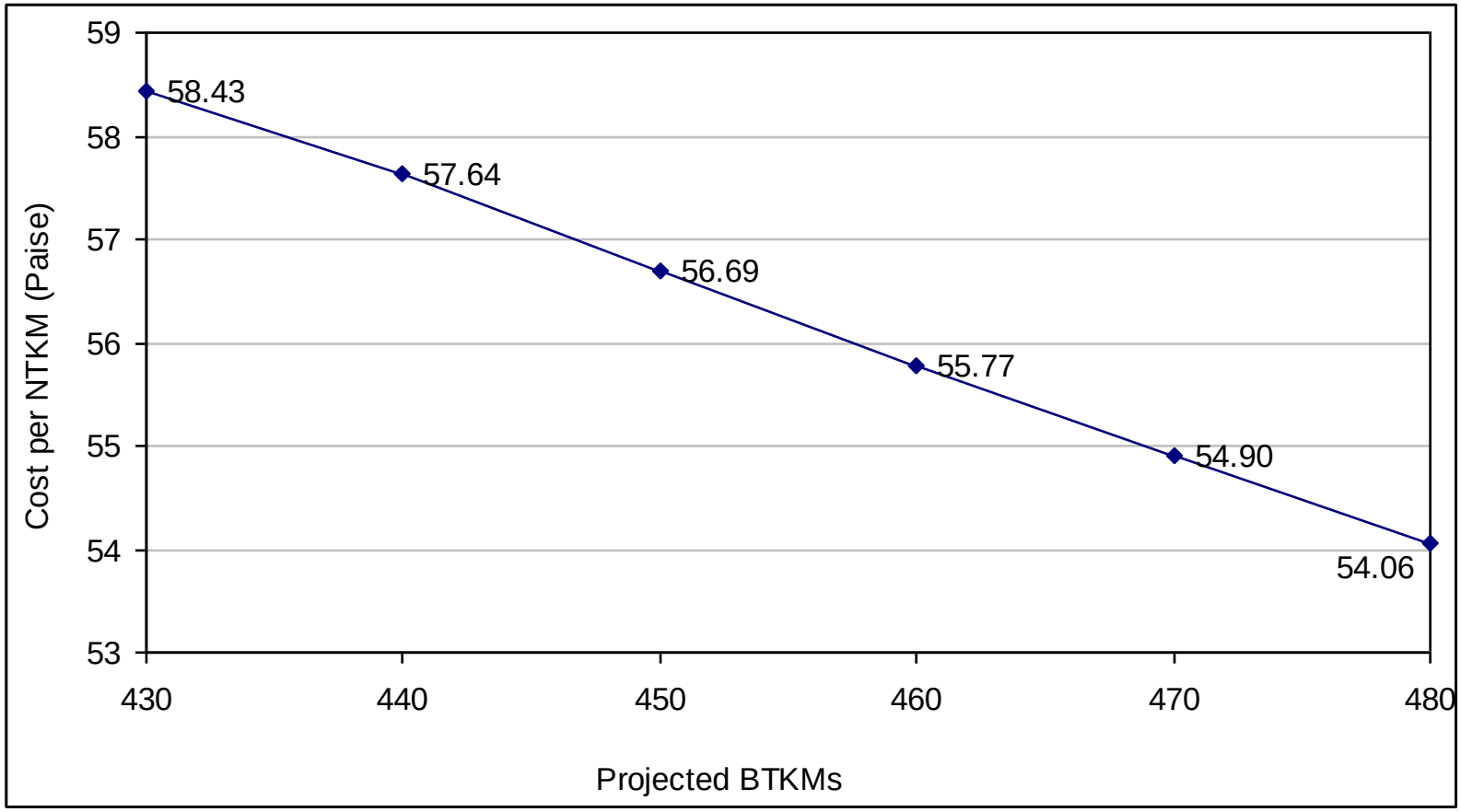
(as on March 31st, 2009)

	Coastal	Non-Coastal	Total
Manufacturing	31	54	85
Services	53	122	175
Total	**78**	**172**	**260**

Source: Ministry of Commerce and Industry

Volume Play: Marginal Net Revenue Analysis for Freight

Cost per NTKM (Base Year 2005-06)



[Source: Sudhir Kumar, 2005]

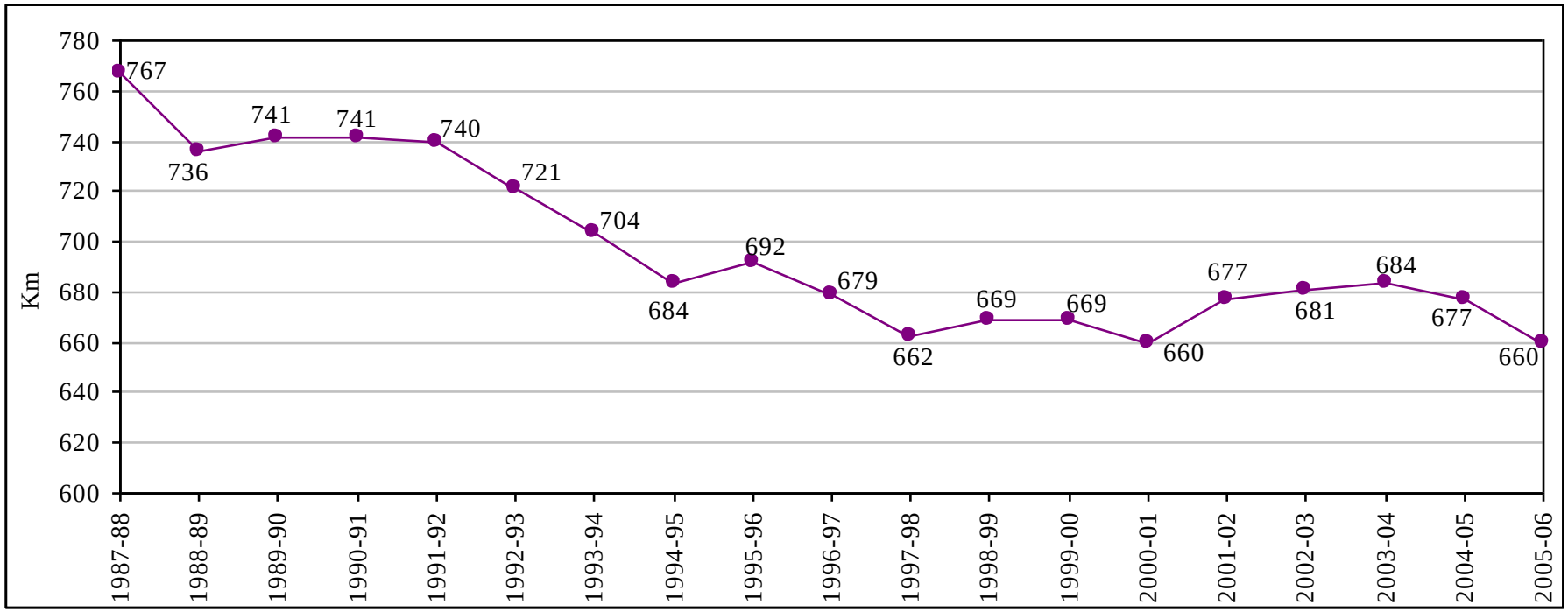
Freight Re-classification: Increased

Commodity	Coal	Fertilizer	Foodgrains	Limestone & Dolomite	Iron Ore for Exports	Iron Ore for Steel Plants
2001-02	130A	85-115	95M		120	120
2002-03	130	95			120	120
2003-04	130			120	120	120
2004-05	140	100	100	140	120 130 (29/10-26/11) 140 (27/11-31/03)	120 130 (29/10-26/11) 140 (27/11-31/03)
2005-06	140	110	110	160	160 (01/04-30/11) 180 (01/12-31/03)	160 (15/05-31/03)
2006-07	140	110 (01/04-31/05) 120 (01/06-)	110 (01/04-31/05) 120 (01/06-)	160 (01/04-30/06) 170 (01/07-)	180	160 (01/04-30/06) 170 (01/07-)
2007-08	140	120	120	160	180	160 (01/04-06/01) 170 (07/01-31/03)
2008-09	140 (01/04-07/12) 150 (08/12-)	120	130 (01/02-)	160	200X (22/05-)	180 (01/04-30.04) 170 (01/05-12/10) 180 (13/10-)

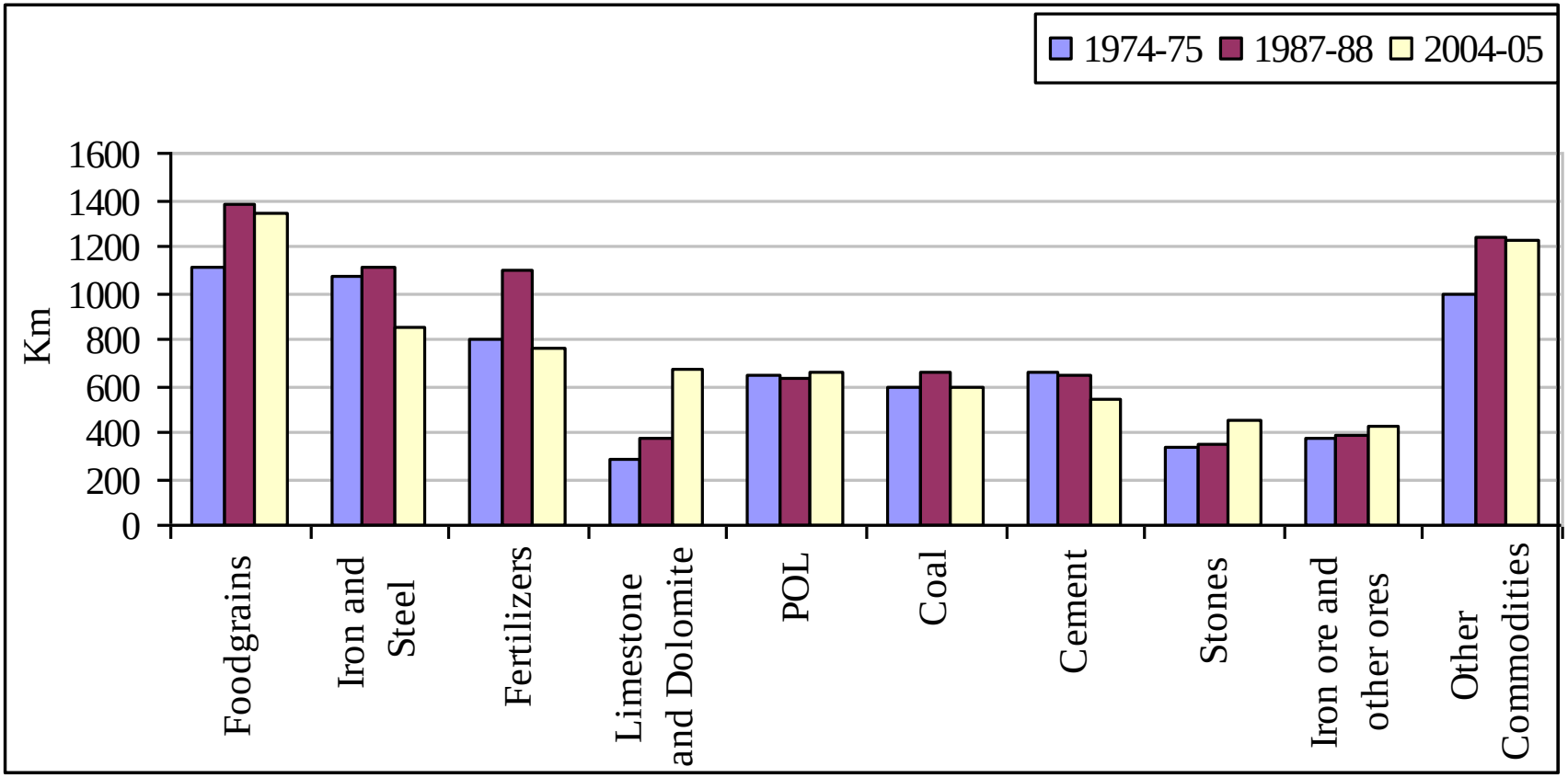
Freight Re-classification: Decreased

Commodity	Cement	POL	Iron & Steel
2001-02	145A	270-290	200A
2002-03	140	280[1]	190
2003-04	135	250[1]	180
2004-05	140	220-250	180
2005-06	140	240	180
2006-07	140	220	180
2007-08	140 (01/04-06/01) 150 (07/01-31/03)	210	180
2008-09	150	200	180

Average Lead of Revenue Earning Freight Traffic



Commodity wise Average Lead



Sub Systems of Railways as an Infrastructure

- Right of Way
- Terminals
- Rolling Stock

Sub Systems of Railways as an Infrastructure

- Right of Way
  - Track (Rails, Sleepers, Ballast, Formation, Bridges, Tunnels)
  - Signaling
  - Electrification

Sub Systems of Railways as an Infrastructure

- Terminals
  - **Freight (Sidings at Mines, Sidings at Industries, Sidings at Ports, Captive Goods Sheds, Public Goods Sheds, ICDs)**
  - Passenger
    - Suburban, Non-Suburban Short Distance, Intercity Day, Long Distance including Night
    - Originating, Connecting, Terminating
    - High Density (many platforms), Low Density

Sub Systems of Railways as an Infrastructure

- Rolling Stock
  - Locomotives
    - Diesel, Electric
    - Single, Multi
  - Coaching
    - AC, Non AC
    - Sleeping, Sitting
    - Reserved, Unreserved
  - **Wagons**
    - **Open, Covered, Flat**
    - **Top Discharge, Side Discharge, Bottom Side Discharge, Bottom Center Discharge**
    - **Speed**

Criteria for Design: Wagon Stock

- Tare to Net
- Functionality for Market Segment
  - Loading, Transit, Unloading
- Safety
- Security
- Maintainability
  - During use, in between use, long term
- Cost

One ton extra loading per wagon provides 60 tons extra loading per year and 10 million extra tons for the entire system. At an average revenue of Rs 500 per ton, a wagon can yield Rs 30,000 per annum. The system can yield Rs 500 crores per annum.

Criteria for Design: Freight Terminals

- Functionality for Market Segment (Type of Terminal, Nature of Commodity)
  - Loading, Unloading
  - Warehousing, Seamless Transfer
  - Level of Automation
  - Other Mode Access
- Safety
- Security
- Maintainability
- Cost