Transport Data between Delhi and Mumbai, and Delhi and Howrah

Table 1-1 Traffic Capacity of Railway and Road Transport in 2003/2004

Delhi - Mumbai

Year:

Mode		Railway			Road Transport		
Specification	Truck	*Single*	*Double*	Carriageway	*lane(s)*		
	Electrification	*Electrification*	*Electrification*	Category	*Highway, National Road, Secondary Road, Feeder Road*		
	Gauge	*m*		Total Width	*(m)*		
		Passenger	Freight		Bus	Passenger Car	Freight Car
Capacity	Formation	*car(s)*	*car(s)*		-	-	-
	Capacity	*person(s)*	*ton*		*person(s)*	*person(s)*	*ton*
Headway		*minute(s)*	*minute(s)*		*minute(s)*	*minute(s)*	*minute(s)*
Service per hour		*time(s)/hour*	*time(s)/hour*		*time(s)/hour*	*time(s)/hour*	*time(s)/hour*
Capacity per hour		*person(s)/hour*	*ton/hour*		*person(s)/hour*	*person(s)/hour*	*ton/hour*
Capacity per width		*person(s)/m*	*ton/m*		*person(s)/m*	*person(s)/m*	*ton/m*

Table 1-2 Traffic Capacity of Railway and Road Transport in 2003/2004

Delhi - Howrah

Year:

Mode		Railway			Road Transport		
Specification	Truck	*Single*	*Double*	Carriageway	*lane(s)*		
	Electrification	*Electrification*	*Electrification*	Category	*Highway, National Road, Secondary Road, Feeder Road*		
	Gauge	*m*		Total Width	*(m)*		
		Passenger	Freight		Bus	Passenger Car	Freight Car
Specification	Formation	*car(s)*	*car(s)*		-	-	-
	Capacity	*person(s)*	*ton*		*person(s)*	*person(s)*	*ton*
	Headway	*minute(s)*	*minute(s)*		*minute(s)*	*minute(s)*	*minute(s)*
	Frequency	*time(s)/hour*	*time(s)/hour*		*time(s)/hour*	*time(s)/hour*	*time(s)/hour*
Capacity per hour		*person(s)/hour*	*ton/hour*		*person(s)/hour*	*person(s)/hour*	*ton/hour*
Capacity per width		*person(s)/m*	*ton/m*		*person(s)/m*	*person(s)/m*	*ton/m*

Transport Data between Delhi and Mumbai, and Delhi and Howrah

Table 1-3 Traffic Volume of Railway and Road Transport in Target Year

Delhi - Mumbai

Year:

Mode		Railway			Road Transport			
Specification	Truck	*Single*	*Double*		Carriageway	*lane(s)*		
	Electrification	*Electrification*	*Electrification*		Category	*Highway, National Road, Secondary Road, Feeder Road*		
	Gauge	*m*			Total Width	*(m)*		
		Passenger	Freight			Bus	Passenger Car	Freight Car
Specification	Formation	*car(s)*	*car(s)*			-	-	-
	Capacity	*person(s)*	*ton*			*person(s)*	*person(s)*	*ton*
	Headway	*minute(s)*	*minute(s)*			*minute(s)*	*minute(s)*	*minute(s)*
	Frequency	*time(s)/hour*	*time(s)/hour*			*time(s)/hour*	*time(s)/hour*	*time(s)/hour*
Capacity per hour		*person(s)/hour*	*ton/hour*			*person(s)/hour*	*person(s)/hour*	*ton/hour*
Capacity per width		*person(s)/m*	*ton/m*			*person(s)/m*	*person(s)/m*	*ton/m*

Table 1-4 Traffic Volume of Railway and Road Transport in Target Year

Delhi - Howrah

Year:

Mode		Railway			Road Transport			
Specification	Truck	*Single*	*Double*		Carriageway	*lane(s)*		
	Electrification	*Electrification*	*Electrification*		Category	*Highway, National Road, Secondary Road, Feeder Road*		
	Gauge	*m*			Total Width	*(m)*		
		Passenger	Freight			Bus	Passenger Car	Freight Car
Specification	Formation	*car(s)*	*car(s)*			-	-	-
	Capacity	*person(s)*	*ton*			*person(s)*	*person(s)*	*ton*
	Headway	*minute(s)*	*minute(s)*			*minute(s)*	*minute(s)*	*minute(s)*
	Frequency	*time(s)/hour*	*time(s)/hour*			*time(s)/hour*	*time(s)/hour*	*time(s)/hour*
Capacity per hour		*person(s)/hour*	*ton/hour*			*person(s)/hour*	*person(s)/hour*	*ton/hour*
Capacity per width		*person(s)/m*	*ton/m*			*person(s)/m*	*person(s)/m*	*ton/m*

Transport Data between Delhi and Mumbai, and Delhi and Howrah

Table 2-1 Traffic Volume and Share by Modes in the Past Decade

Delhi - Mumbai

unit: (passenger: million passengers km)
(freight: million ton km)

Mode	Railway		Road Transport		Air		Total	
	Passenger	Freight	Bus	Freight	Passenger	Freight	Passenger	Freight
1995	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
1996	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
1997	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
1998	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
1999	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
2000	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
2001	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
2002	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
2003	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
2004	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*

Table 2-2 Traffic Demand Forecast by Modes

Delhi - Mumbai

unit: (passenger: million passengers km)
(freight: million ton km)

Mode	Railway		Road Transport		Air		Total	
	Passenger	Freight	Bus	Freight	Passenger	Freight	Passenger	Freight
2005	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
2010	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
2015	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
2020	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*
	( )	( )	( )	( )	( )	( )	*(100)*	*(100)*

Transport Data between Delhi and Mumbai, and Delhi and Howrah

Table 2-3 Traffic Volume and Share by Modes in the Past Decade

Delhi - Howrah

unit: (passenger: million passengers km)
(freight: million ton km)

Mode	Railway		Road Transport		Air		Total	
	Passenger	Freight	Bus	Freight	Passenger	Freight	Passenger	Freight
1995	( )	( )	( )	( )	( )	( )	(100)	(100)
1996	( )	( )	( )	( )	( )	( )	(100)	(100)
1997	( )	( )	( )	( )	( )	( )	(100)	(100)
1998	( )	( )	( )	( )	( )	( )	(100)	(100)
1999	( )	( )	( )	( )	( )	( )	(100)	(100)
2000	( )	( )	( )	( )	( )	( )	(100)	(100)
2001	( )	( )	( )	( )	( )	( )	(100)	(100)
2002	( )	( )	( )	( )	( )	( )	(100)	(100)
2003	( )	( )	( )	( )	( )	( )	(100)	(100)
2004	( )	( )	( )	( )	( )	( )	(100)	(100)

Table 2-4 Traffic Demand Forecast by Modes

Delhi - Howrah

unit: (passenger: million passengers km)
(freight: million ton km)

Mode	Railway		Road Transport		Air		Total	
	Passenger	Freight	Bus	Freight	Passenger	Freight	Passenger	Freight
2005	( )	( )	( )	( )	( )	( )	(100)	(100)
2010	( )	( )	( )	( )	( )	( )	(100)	(100)
2015	( )	( )	( )	( )	( )	( )	(100)	(100)
2020	( )	( )	( )	( )	( )	( )	(100)	(100)
	( )	( )	( )	( )	( )	( )	(100)	(100)
	( )	( )	( )	( )	( )	( )	(100)	(100)
	( )	( )	( )	( )	( )	( )	(100)	(100)
	( )	( )	( )	( )	( )	( )	(100)	(100)
	( )	( )	( )	( )	( )	( )	(100)	(100)
	( )	( )	( )	( )	( )	( )	(100)	(100)

Transport Data between Delhi and Mumbai, and Delhi and Howrah

Table 3-1 Freight Volume by Freight Modes in the Past Decade
from Mumbai to Delhi

unit: 1,000ton

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
Railway											
Container											
Balk											
Others											
Road Freight											
Total											

Table 3-2 Freight Volume by Freight Modes in the Past Decade
from Howrah to Delhi

unit: 1,000ton

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
Railway											
Container											
Balk											
Others											
Road Freight											
Total											

Table 3-3 Passenger Volume by Freight Modes in the Past Decade
from Mumbai to Delhi

unit: 1,000persons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
Railway											
Road Transport (Bus)											
Total											

Table 3-4 Freight Volume by Freight Modes in the Past Decade
from Howrah to Delhi

unit: 1,000persons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
Railway											
Road Transport (Bus)											
Total											

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Transport Data between Delhi and Mumbai, and Delhi and Howrah

Table 3-5 Freight Demand Forecast by Freight Modes in the Decade Ahead

from Mumbai to Delhi

unit: 1,000ton

	2005	2010	2015	2020							Total
Railway											
Container											
Balk											
Others											
Road Freight											
Total											

Table 3-6 Freight Demand Forecast by Freight Modes in the Decade Ahead

from Howrah to Delhi

unit: 1,000ton

	2005	2010	2015	2020							Total
Railway											
Container											
Balk											
Others											
Road Freight											
Total											

Table 3-7 Passenger Demand Forecast by Freight Modes in the decade ahead

from Mumbai to Delhi

unit: 1,000persons

	2005	2010	2015	2020							Total
Railway											
Road Transport (Bus)											
Total											

Table 3-8 Passenger Demand Forecast by Freight Modes in the decade ahead

from Howrah to Delhi

unit: 1,000persons

	2005	2010	2015	2020							Total
Railway											
Road Transport (Bus)											
Total											

Transport Data between Delhi and Mumbai, and Delhi and Howrah

Table 4-1 Freight Volume by Commodities in the Past Decade

(1) from Mumbai to Delhi

unit: 1,000ton

Main commodities	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
Sub-total											
Container											
Road Freight											
Total											

Table 4-2 Freight Volume by Commodities in the Past Decade

(2) from Howrah to Delhi

unit: 1,000ton

Main commodities	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
Sub-total											
Container											
Road Freight											
Total											

Transport Data between Delhi and Mumbai, and Delhi and Howrah

Table 5-1 Specification of Main Diesel Locomotive

	example *DD51*	current state	current state	current state	future	future	future
Use Application	*Main Line*						
Wheel Arrangement	*B-2-B*						
Weight in Working Order	*84.0*						
Engine							
- Type	*DML61Z*						
- Power (PS)	*1,100 x 2*						
- Redline (rpm)	*1,500*						
Transmission Gear Type	*Hydraulic*						
Steam Generator	*Equipped*						
Max Speed (km/h)	*95*						
Power per Weight (ps/t)	*26.2*						
Year of Manufacture	*1962*						

Table 5-2 Specification of Main Electric Locomotive

	example *FE200*	current state	current state	current state	future	future	future
Use Application	*Main Line*						
Electric Type	*DC1.5kV*						
Wheel Arrangement	*B-B-b*						
Weight in Working Order	*100.8*						
Max length (m)	*19.4*						
Traction wheel Diameter(	*1,120*						
Max Speed (km/h)	*120*						
Rated Power(kw)	*6000*						
Rated Tractive Effort	*26.6*						
Rated Speed(km/h)	*81.2*						
Traction Moter Type	*DC*						
Energy Transmission Syste	*Movable*						
Regenerative Brake							
Year of Manufacture	*1990*						

Transport Data between Delhi and Mumbai, and Delhi and Howrah

Table 6 Specification of Main Freight-train Car

	example KOKI-100	current state	current state	current state	future	future	future
Type	Container						
Wheel Arrangement	Two-axle Bogie Car						
Empty Weight (ton)	17.8						
Loading (ton)	40.5						
Maximum Length (m)	19.9						
Running Part	Air Suspension Type						
Maximum Speed (km/h)	110						
Loading/Empty Weight	2.3						
Year of Manufacture	1988						

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Table 7-1

Table-the construction unit cost per km of each structures

The construction unit cost per km of each structures the existing lines between Munbai and Delhi, Delhi and Howrah and the total length and ratio of each structure. The construction unit cost per km of each structure means the average unit cost of each structure with consideration long and short structure, big and small structure, or like this.

1. Munbai - Delhi

Sort of structure	① Total length of each structure(Km)	② Construction unit cost per U$/ km	③=①×② each construction cost (U$)	Ratio of each structure	Standard design NO	Remarks
1.Embankment						
2.Cutting						
3.Elevated Track						
4.Brige						
5.Tunnle						
6.Truck						
7.Station *						
8.All Electric Facility						
9.Right of way						
Total						

* Station includes architecture. Each structure includes site manage expenditure and all kinds manage expenditure.

** All Electric Facility includes signaling, telecommunication, substation, feeder, mast, etc.

Table 7-2

2. Howrah - Delhi

Sort of structure	① Total length of each structure(Km)	② Construction unit cost per U$/ km	③=①×② each construction cost (U$)	Ratio of each structure	Standard design NO	Remarks
1.Embankment						
2.Cutting						
3.Elevated Track						
4.Brige						
5.Tunnle						
6.Truck						
7.Station *						
8.All Electric Facility **						
9.Right of way						
Total						

* Station includes architecture. Each structure includes site manage expenditure and all kinds manage expenditure.

** All Electric Facility includes signaling, telecommunication, substation, feeder, mast, etc.