

Appendix 15 Environmental Conditions Surveys

A15.1 Measurement of sediment material quality

A15.1.1 Location of sites

Table A15.1.1 The Sites for Monitoring of Sedimentation Material Quality

Symbol	Description	N	E
S-1	Thuong Cat Port	21 ° 06'37.9"	105 ° 43'53.0"
S-2	Hoang Xa Commune	21 ° 05'30.2"	105 ° 46'01.5"
S-3	Thang Long Bridge	21 ° 05'42.7"	105 ° 47'15.0"
S-4	Van Phuc Island (the South side)	21 ° 05'06.9"	105 ° 49'49.5"
S-5	Van Phuc Island (the North side)	21 ° 05'14.7"	105 ° 49'58.1"
S-6	Dau Mouth (the Duong River)	21 ° 04'56.1"	105 ° 49'58.0"
S-7	Thuong Cat Hydrological Station	21 ° 04'15.4"	105 ° 52'46.5"
S-8	Location between the Long Bien and Chuong Duong Bridges (the North side)	21 ° 02'30.1"	105 ° 51'41.4"
S-9	Location between the Long Bien and Chuong Duong Bridges (the South side)	21 ° 02'24.4"	105 ° 51'41.3"
S-10	Hanoi Port	21 ° 00'14.6"	105 ° 52'37.0"
S-11	Bat Trang Ceramic Traditional Village	20 ° 58'32.0"	105 ° 54'27.8"
S-12	Thanh Tri Bridge	20 ° 59'28.7"	105 ° 54'04.1"
S-13	Khuyen Luong Port	20 ° 57'18.4"	105 ° 53'38.3"

Source) JICA Study Team

A15.1.2 Results of measurement

Table A15.1.2 The Results of Measurement of Sediment Materials Quality

No	Parameter	Unit	S-1	S-2	S-3	S-4	S-5	S-6	S-7
1	Pesticide	μg/kg	1.89	2.37	2.69	1.41	0.55	1.47	1.09
2	N-hexan	mg/kg	6.8	4.2	5.7	6.2	4.8	10.4	8.1
3	Cadmium	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4	Lead	mg/kg	52.86	35.33	14.08	13.41	20.92	22.51	11.24
5	Chromium	mg/kg	12.8	7.7	6.4	8.2	6.9	5.9	9.1
6	Arsenic	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
7	Mercury	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8	Iginition of lose	%	4.99	5.83	1.57	1.45	1.61	1.30	1.11

Source) The Environmental Technology Center (ENTEC), Feb., 2002

(Continue)

No	Parameter	Unit	S-8	S-9	S-10	S-11	S-12	S-13	Note
1	Pesticide	µg/kg	0.82	1.29	0.02	2.52	1.58	1.20	
2	N-hexan	mg/kg	7.2	4.4	3.8	4.2	3.4	6.2	
3	Cadmium	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
4	Lead	mg/kg	10.73	22.53	21.33	47.05	38.76	27.51	
5	Chromium	mg/kg	8.4	7.6	7.8	8.1	7.0	11.0	
6	Arsenic	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
7	Mercury	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
8	Iginition of lose	%	2.38	1.53	2.88	3.98	2.60	1.70	

Source) The Environmental Technology Center (ENTEC), Feb., 2002

A15.2 Measurement of water quality

A15.2.1 Location of sites

Table A15.2.1 The Sites for Water Sampling and in Site Measurement

Symbol	Description	N	E
W-1-x	Thuong Cat Port	21 ° 06'37.9"	105 ° 43'53.0"
W-2-x	Hoang Xa Commune	21 ° 05'30.2"	105 ° 46'01.5"
W-3-x	Thang Long Bridge	21 ° 05'42.7"	105 ° 47'15.0"
W-4-x	Van Phuc Island (the South side)	21 ° 05'06.9"	105 ° 49'49.5"
W-5-x	Van Phuc Island (the North side)	21 ° 05'14.7"	105 ° 49'58.1"
W-6-x	Dau Mouth (the Duong River)	21 ° 04'56.1"	105 ° 49'58.0"
W-7-x	Thuong Cat Hydrological Station	21 ° 04'15.4"	105 ° 52'46.5"
W-8-x	Location between the Long Bien and Chuong Duong Bridges (the North side)	21 ° 02'30.1"	105 ° 51'41.4"
W-9-x	Location between the Long Bien and Chuong Duong Bridges (the South side)	21 ° 02'24.4"	105 ° 51'41.3"
W-10-x	Hanoi Port	21 ° 00'14.6"	105 ° 52'37.0"
W-11-x	Bat Trang Ceramic Traditional Village	20 ° 58'32.0"	105 ° 54'27.8"
W-12-x	Thanh Tri Bridge	20 ° 59'28.7"	105 ° 54'04.1"
W-13-x	Khuyen Luong Port	20 ° 57'18.4"	105 ° 53'38.3"

Note) x = 1 – the water sample collected at the depth of 0.5m from the water surface;

x = 2 – the water sample collected at the middle depth;

x = 3 – the water sample collected at the depth of 0.25m from the bottom

Source) JICA Study Team

A15.2.2 Results of measurement

Table A15.2.2 The Results of Measurement of Water Quality

No	Parameter	Unit	Point W-1			Point W-2		
			W-1-1	W-1-2	W-1-3	W-2-1	W-2-2	W-2-3
1	Temperature	° C	21.6	21.2	20.5	25.3	24.8	24.1
2	Salinity	mg/l	5.1	5.1	4.7	5.2	5.2	5.2
3	pH	-	8.1	8.2	8.2	8.2	8.3	8.3
4	SS	mg/l	154	156	150	135	132	136
5	DO	mg/l	8.5	5.6	5.6	7.2	6.3	6.4
6	BOD ₅	mg/l	1.5	1.7	1.4	1.6	1.2	1.1
7	Nitrogen	mg/l	0.60	0.54	0.48	0.70	0.72	0.62
8	Phosphorus	mg/l	0.92	0.90	0.59	2.03	1.71	0.94
9	Coliform	MPN/100ml	2,100	2,800	7,500	240	1,500	1,500
10	N-hexan	mg/l	0.01	0.01	<0.01	0.06	0.03	0.03
11	Cadmium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
12	Lead	mg/l	0.005	0.008	0.001	0.002	0.002	0.002
13	Chromium	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
14	Arsenic	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.02
15	Mercury	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Source) The Environmental Technology Center (ENTEC), Feb., 2002

(Continue)

No	Parameter	Unit	Point W-3			Point W-4		
			W-3-1	W-3-2	W-3-3	W-4-1	W-4-2	W-4-3
1	Temperature	° C	26.0	24.6	23.8	18.9	18.6	18.7
2	Salinity	mg/l	5.6	5.2	5.1	4.7	4.3	4.2
3	pH	-	8.3	8.3	8.3	8.2	8.2	8.2
4	SS	mg/l	142	147	138	145	140	139
5	DO	mg/l	6.8	6.6	6.7	7.6	7.6	7.2
6	BOD ₅	mg/l	1.7	2.0	1.4	1.4	1.7	1.4
7	Nitrogen	mg/l	0.34	0.32	0.32	0.46	0.46	0.32
8	Phosphorus	mg/l	0.56	0.67	0.80	0.60	0.98	0.50
9	Coliform	MPN/100ml	2,000	920	150	210	430	230
10	N-hexan	mg/l	0.08	0.09	0.02	0.15	-.13	0.09
11	Cadmium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
12	Lead	mg/l	0.002	0.004	0.028	0.002	0.003	0.009
13	Chromium	mg/l	<0.01	<0.01	<0.01	0.01	<0.01	0.01
14	Arsenic	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15	Mercury	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Source) The Environmental Technology Center (ENTEC), Feb., 2002

(Continue)

No	Parameter	Unit	Point W-5			Point W-6		
			W-5-1	W-5-2	W-5-3	W-6-1	W-6-2	W-6-3
1	Temperature	° C	18.8	18.8	18.7	19.2	18.6	18.8
2	Salinity	mg/l	5.1	4.7	4.7	5.2	5.1	4.7
3	pH	-	8.3	8.2	8.3	8.2	8.2	8.2
4	SS	mg/l	138	136	102	131	114	103
5	DO	mg/l	7.4	7.1	6.9	7.9	7.3	7.3
6	BOD ₅	mg/l	1.1	1.7	1.9	1.5	1.2	1.7
7	Nitrogen	mg/l	0.44	0.42	0.42	0.38	0.40	0.44
8	Phosphorus	mg/l	1.84	0.91	1.27	0.58	0.80	0.76
9	Coliform	MPN/100ml	360	150	750	200	93	1,100
10	N-hexan	mg/l	0.39	0.25	0.08	0.32	0.24	0.11
11	Cadmium	mg/l	<0.001	<0.001	<0.001	0.007	<0.001	<0.001
12	Lead	mg/l	0.009	0.016	0.023	0.003	0.004	0.008
13	Chromium	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
14	Arsenic	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15	Mercury	mg/l	0.001	<0.001	0.001	0.001	<0.001	<0.001

Source) The Environmental Technology Center (ENTEC), Feb., 2002

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No	Parameter	Unit	Point W-7			Point W-8		
			W-7-1	W-7-2	W-7-3	W-8-1	W-8-2	W-8-3
1	Temperature	° C	19.8	18.7	18.7	19.6	19.1	18.8
2	Salinity	mg/l	4.7	4.3	4.3	3.6	3.6	3.3
3	pH	-	8.2	8.2	8.3	8.1	8.3	8.3
4	SS	mg/l	108	106	104	126	124	130
5	DO	mg/l	7.8	7.4	7.2	7.1	6.4	6.8
6	BOD ₅	mg/l	1.6	1.2	1.5	1.3	1.4	1.5
7	Nitrogen	mg/l	0.34	0.32	0.40	0.48	0.52	0.54
8	Phosphorus	mg/l	1.52	0.85	0.80	0.61	0.44	0.40
9	Coliform	MPN/100ml	430	93	9	93	210	150
10	N-hexan	mg/l	0.63	0.14	0.12	0.23	0.13	0.11
11	Cadmium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
12	Lead	mg/l	0.010	0.008	0.028	0.002	0.001	0.007
13	Chromium	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
14	Arsenic	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15	Mercury	mg/l	<0.001	<0.001	<0.001	0.001	<0.001	<0.001

Source) The Environmental Technology Center (ENTEC), Feb., 2002

(Continue)

No	Parameter	Unit	Point W-9			Point W-10		
			W-9-1	W-9-2	W-9-3	W-10-1	W-10-2	W-10-3
1	Temperature	° C	18.7	18.8	18.8	16.5	17.4	17.9
2	Salinity	mg/l	4.7	4.7	4.3	4.7	4.7	4.7
3	pH	-	8.3	8.3	8.3	8.3	8.3	8.3
4	SS	mg/l	155	161	149	160	155	125
5	DO	mg/l	6.7	6.7	6.9	7.5	7.5	7.2
6	BOD ₅	mg/l	2.0	1.9	2.0	1.9	1.9	1.8
7	Nitrogen	mg/l	0.62	0.54	0.60	0.42	0.42	0.44
8	Phosphorus	mg/l	0.90	0.79	0.55	0.92	0.51	0.46
9	Coliform	MPN/100ml	150	92	4,600	240	74	36
10	N-hexan	mg/l	0.14	0.12	0.11	0.76	0.06	0.04
11	Cadmium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
12	Lead	mg/l	<0.01	0.013	0.016	0.001	0.007	0.009
13	Chromium	mg/l	<0.01	<0.01	<0.01	0.013	<0.01	<0.01
14	Arsenic	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15	Mercury	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Source) The Environmental Technology Center (ENTEC), Feb., 2002

(Continue)

No	Parameter	Unit	Point W-11			Point W-12		
			W-11-1	W-11-2	W-11-3	W-12-1	W-12-2	W-12-3
1	Temperature	° C	16.5	17.4	17.8	16.7	17.6	17.4
2	Salinity	mg/l	6.0	5.1	5.2	5.6	4.3	4.7
3	pH	-	8.3	8.3	8.4	8.3	8.3	8.3
4	SS	mg/l	155	150	150	145	159	147
5	DO	mg/l	7.2	6.8	6.8	7.1	6.7	7.0
6	BOD ₅	mg/l	1.9	1.9	1.7	1.2	1.3	1.3
7	Nitrogen	mg/l	0.58	0.62	0.44	0.44	0.70	0.42
8	Phosphorus	mg/l	0.51	0.50	0.46	0.44	0.39	0.40
9	Coliform	MPN/100ml	1,500	430	1,500	2,100	930	11,000
10	N-hexan	mg/l	0.25	0.13	0.09	0.41	0.08	0.06
11	Cadmium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
12	Lead	mg/l	0.002	0.025	0.002	0.005	0.013	0.007
13	Chromium	mg/l	<0.01	<0.01	0.01	<0.01	<0.01	0.011
14	Arsenic	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15	Mercury	mg/l	0.001	<0.001	<0.001	0.002	<0.001	<0.001

Source) The Environmental Technology Center (ENTEC), Feb., 2002

(Continue)

No	Parameter	Unit	Point W-13		
			W-13-1	W-3-2	W-13-3
1	Temperature	° C	16.9	17.3	17.3
2	Salinity	mg/l	5.1	4.7	4.7
3	pH	-	8.3	8.3	8.4
4	SS	mg/l	167	164	153
5	DO	mg/l	7.2	7.2	7.0
6	BOD ₅	mg/l	1.4	1.5	1.5
7	Nitrogen	mg/l	0.62	0.44	0.40
8	Phosphorus	mg/l	0.75	0.80	0.66
9	Coliform	MPN/100ml	15,000	7,500	9,300
10	N-hexan	mg/l	0.17	0.14	0.11
11	Cadmium	mg/l	<0.001	<0.001	<0.001
12	Lead	mg/l	0.008	0.009	0.017
13	Chromium	mg/l	0.01	0.014	<0.01
14	Arsenic	mg/l	<0.01	<0.01	<0.01
15	Mercury	mg/l	<0.001	<0.001	<0.001

Source) The Environmental Technology Center (ENTEC), Feb., 2002

A15.3 Measurement of benthos in riverbed

A15.3.1 Location of sites

Table A15.3.1 The Sites for Monitoring of Benthos in Riverbed

Symbol	Description	N	E
B-1	Thuong Cat Port	21 ° 06'37.9"	105 ° 43'53.0"
B-2	Hoang Xa Commune	21 ° 05'30.2"	105 ° 46'01.5"
B-3	Thang Long Bridge	21 ° 05'42.7"	105 ° 47'15.0"
B-4	Van Phuc Island (the South side)	21 ° 05'06.9"	105 ° 49'49.5"
B-5	Van Phuc Island (the North side)	21 ° 05'14.7"	105 ° 49'58.1"
B-6	Dau Mouth (the Duong River)	21 ° 04'56.1"	105 ° 49'58.0"
B-7	Thuong Cat Hydrological Station	21 ° 04'15.4"	105 ° 52'46.5"
B-8	Location between the Long Bien and Chuong Duong Bridges (the North side)	21 ° 02'30.1"	105 ° 51'41.4"
B-9	Location between the Long Bien and Chuong Duong Bridges (the South side)	21 ° 02'24.4"	105 ° 51'41.3"
B-10	Hanoi Port	21 ° 00'14.6"	105 ° 52'37.0"
B-11	Bat Trang Ceramic Traditional Village	20 ° 58'32.0"	105 ° 54'27.8"
B-12	Thanh Tri Bridge	20 ° 59'28.7"	105 ° 54'04.1"
B-13	Khuyen Luong Port	20 ° 57'18.4"	105 ° 53'38.3"

Source) JICA Study Team

A15.3.2 Results of measurement of benthos in riverbed

Table A15.3.2 The Results of Measurement of Benthos in Riverbed

(Unit: pieces)

No	Species	Family	B-1	B-2	B-3	B-4	B-5	B-6	B-7
1	Corbicula	Corbiculidae	03	01	01	03	05	-	0
2	Littorina	Littorinidae	0.3	-	-	-	-	-	0
3	Spironto-caris	-	50	09	11	47	52	65	0
4	Marcromia	Marcromidae	02	14	01	04	03	27	0
5	Torebia	Thiaidae	01		-	-	-	-	0
6	Tagelus	Psammobiidae	-	01	-	-	-	-	0
7	Compeloma	Viviparidae	-	-	09	-	-	-	0
8	Notonecta	Notonectidae	-	-	-	-	-	-	-

Source) The Environmental Technology Center (ENTEC), Feb., 2002

(Continue)

(Unit: pieces)

No	Species	Family	B-8	B-9	B-10	B-11	B-12	B-13	Note
1	Corbicula	Corbiculidae	-	-	02	-	08	06	
2	Littorina	Littorinidae	-	-	-	-	-		
3	Spironto-caris	-	42	-	18	33	26	41	
4	Marcromia	Marcromidae	01	12	05	11	07	11	
5	Torebia	Thiaidae	-	243	-	03	-	05	
6	Tagelus	Psammobiidae	-	-	-	-	-	-	
7	Compeloma	Viviparidae	-	-	-	-	-	-	
8	Notonecta	Notonectidae	-	-	01	-	-	-	

Source) The Environmental Technology Center (ENTEC), Feb., 2002

A15.4 Measurement of air quality

A15.4.1 Location of sites

Table A15.4.1 The Sites for Air Sampling

Symbol	Description	N	E
A-1-t	Thuong Cat Port	21 ° 06'33.0"	105 ° 43'38.0"
A-2-t	Van Kiep Port	21 ° 00'58.0"	105 ° 51'55.1"
A-3-t	Hanoi Port	21 ° 00'20.0"	105 ° 52'18.7"
A-4-t	Khuyen Luong Port	21 ° 57'14.6"	105 ° 53'20.6"

Note) t = 1 – the air sample collected from 7:00 – 9:00;
t = 2 – the air sample collected from 12:00 – 14:00;
t = 3 – the air sample collected from 17:00 – 19:00

Source) JICA Study Team

A15.4.2 The results of measurement of air quality

Table A15.4.2 The Sites for Air Sampling

The results of measurement of air quality (in the first day)

No	Parameter	Unit	Point A-1			Point A-2		
			A-1-1	A-1-2	A-1-3	A-2-1	A-2-2	A-2-3
1	SPM	mg/m ³	0.28	0.24	0.41	0.38	0.24	0.28
2	SO ₂	mg/m ³	0.073	0.071	0.076	0.071	0.065	0.055
3	CO	mg/m ³	1.95	1.21	2.24	1.39	1.85	2.14
4	NO ₂	mg/m ³	0.044	0.038	0.055	0.038	0.055	0.047
5	VOC	mg/m ³	0.46	0.17	0.27	0.75	0.17	9.46

Source) The Environmental Technology Center (ENTEC), Feb., 2002

(Continue)

No	Parameter	Unit	Point A-3			Point A-4		
			A-3-1	A-3-2	A-3-3	A-4-1	A-4-2	A-4-3
1	SPM	mg/m ³	0.36	0.21	0.28	<0.01	<0.01	0.13
2	SO ₂	mg/m ³	0.065	0.079	0.060	0.076	0.079	0.060
3	CO	mg/m ³	2.14	2.04	2.04	1.21	1.57	1.39
4	NO ₂	mg/m ³	0.038	0.055	0.049	0.060	0.072	0.055
5	VOC	mg/m ³	0.27	3.44	0.75	0.36	0.17	0.65

Note) Bold figures mean those samples collected while raining.

Source) The Environmental Technology Center (ENTEC), Feb., 2002

The results of measurement of air quality (in the second day)

No	Parameter	Unit	Point A-1			Point A-2		
			A-1-1	A-1-2	A-1-3	A-2-1	A-2-2	A-2-3
1	SPM	mg/m ³	0.38	0.31	0.36	0.36	0.41	0.31
2	SO ₂	mg/m ³	0.063	0.068	0.079	0.097	0.085	0.079
3	CO	mg/m ³	1.76	1.57	1.57	2.14	1.39	1.48
4	NO ₂	mg/m ³	0.028	0.028	0.055	0.089	0.083	0.072
5	VOC	mg/m ³	0.36	0.17	0.27	3.87	3.04	3.58

Source) The Environmental Technology Center (ENTEC), Feb., 2002

(Continue)

No	Parameter	Unit	Point A-3			Point A-4		
			A-3-1	A-3-2	A-3-3	A-4-1	A-4-2	A-4-3
1	SPM	mg/m ³	0.26	0.32	0.28	<0.01	0.17	0.23
2	SO ₂	mg/m ³	0.060	0.071	0.068	0.076	0.079	0.085
3	CO	mg/m ³	1.57	2.14	1.85	1.85	2.04	1.85
4	NO ₂	mg/m ³	0.055	0.048	0.038	0.072	0.038	0.066
5	VOC	mg/m ³	3.58	2.28	3.17	3.58	1.93	3.44

Source) The Environmental Technology Center (ENTEC), Feb., 2002

Appendix 16 Socio-economic Framework

As supporting and/or complementary data and information for **Chapter 16**, the following tables are provided in this Appendix:

Table A16.1.1 covering population estimated by province for the years 2000, 2010 and 2020

Table A16.2.1 covering GDP estimate for the years 2010 and 2020, and in respect to major regions including Red River Delta, corresponding to low assumption case

Table A16.2.2 Ditto (high assumption case)

Table A16.2.3 Ditto (average of the low and high assumption cases)

Table A16.2.4 covering GDP trend by region from 1995 to 2020

Table A16.2.5 covering province-wise GDP share to RRD Total

Table A16.2.6 covering production and consumption of stone for the years 1999, 2010 and 2020

Table A16.2.7 covering production and consumption of sand for the years 1999, 2010 and 2020

Table A16.2.8 covering production and consumption of cement for the years 1999, 2010 and 2020

Table A16.2.9 covering production and consumption of fertilizer for the years 1999, 2010 and 2020

Table A16.2.10 covering production and consumption of coal for the years 1999, 2010 and 2020

Table A16.1.1 Population Estimate by Province

(unit:'000 persons)

Region	Province	2000	2010	2020
Red River Delta	Hanoi	2,736	2,989	3,590
	Haiphong	1,691	1,984	2,200
	Hai Duong	1,668	2,035	2,275
	Hung Yen	1,082	1,300	1,453
	Thai Binh	1,792	2,145	2,383
	Nam Dinh	1,905	2,291	2,571
	Ninh Binh	888	1,103	1,249
	Ha Nam	798	988	1,070
	Ha Tay	2,411	2,863	3,233
	Subtotal	14,971	17,699	20,024
North East	Cao Bang	497	665	740
	Lang Son	711	815	872
	Quang Ninh	1,018	1,456	1,845
	Thai Nguyen	1,054	1,104	1,184
	Bac Can	280	379	420
	Bac Ninh	949	1,131	1,270
	Bac Giang	1,509	1,650	1,806
	Phu Tho	1,274	1,715	1,999
	Vinh Phuc	1,103	1,311	1,487
	Lao Cai	613	738	843
	Yen Bai	686	955	1,128
	Quang	686	938	1,114
	Ha Giang	618	760	906
	Subtotal	10,998	13,616	15,613
North West	Son La	907	1,038	1,187
	Lai Chau	613	717	827
	Hoa Binh	767	1,009	1,144
	Subtotal	2,287	2,764	3,158
Total		28,256	34,079	38,796

Note) Obtained from "Statistical Yearbook (2000)"

Table A16.2.1 GDP Estimate, Low Assumption

(Unit: VND billion)

Region	Province	2010				2020			
		Total	Primary	Secondary	Tertiary	Total	Primary	Secondary	Tertiary
Red River Delta	Hanoi	34300.2	573.0	17988.8	17738.3	43590.3	322.1	32265.8	31002.4
	Haiphong	13272.0	1524.7	4530.1	5217.2	21454.0	1655.9	9310.7	10487.4
	Hai Duong	8699.9	1711.5	4200.9	2787.6	14184.1	1748.0	7080.1	5356.0
	Hung Yen	5548.7	1504.1	2291.7	1753.0	9042.9	1605.4	3787.3	3650.2
	Thai Binh	7568.4	2036.7	2913.1	2618.5	12262.8	2143.1	4944.7	5174.9
	Nam Dinh	7387.7	1156.7	3020.5	3210.5	12090.6	1185.4	4916.0	5989.2
	Ninh Binh	2811.4	722.1	1377.9	711.4	4641.5	833.9	2354.4	1453.2
	Ha Nam	3245.2	651.8	1354.0	1239.3	5122.1	656.9	2073.5	2391.6
	Ha Tay	10063.2	2296.5	4908.5	2858.2	16568.9	2600.6	8244.5	5723.8
	Subtotal	94896.7	12177.0	44585.6	38134.1	158957.2	12751.5	74977.0	71228.8
	North East	Cao Bang	1903.0	1039.3	292.8	570.9	3023.2	1450.5	547.1
Lang Son		2533.9	1259.7	443.4	830.8	3864.9	1692.7	805.7	1366.5
Quang Ninh		7573.1	539.8	3722.2	3261.1	13695.2	856.6	6797.1	6041.4
Thai Nguyen		2779.9	1040.2	1002.8	736.9	4251.0	1203.3	1810.3	1237.3
Bac Can		651.7	426.6	133.0	92.1	1029.6	648.4	254.0	127.2
Bac Ninh		4012.1	858.3	2010.6	1143.2	6426.4	922.4	3402.3	2101.7
Bac Giang		3867.6	1460.5	1489.8	917.3	6038.9	2183.0	2437.5	1418.4
Phu Tho		5215.4	1124.1	2233.1	1858.2	8671.5	1421.4	3975.2	3275.0
Vinh Phuc		4504.9	1580.0	911.7	2013.2	7290.4	2020.9	1611.3	3658.1
Lao Cai		1656.4	688.2	478.1	490.1	2696.8	973.8	895.7	827.2
Yen Bai		2355.9	1024.9	919.2	411.9	3971.0	1344.3	1912.1	714.5
Tuyen Quang		2289.5	944.0	617.9	727.7	3882.6	1450.2	1227.3	1205.0
Ha Giang		1290.2	723.6	308.1	258.5	2195.2	1108.5	615.7	470.9
Subtotal		40633.7	12709.3	14612.6	13311.8	67036.5	17276.1	26291.4	23469.0
North West	Son La	2416.8	1637.8	480.0	299.0	3982.9	2623.0	838.1	521.8
	Lai Chau	1603.9	509.8	704.5	389.7	2667.4	703.7	1270.8	692.9
	Hoa Binh	2773.8	1153.7	977.2	642.9	4530.1	1745.3	1465.4	1119.4
	Subtotal	6794.6	3301.3	2161.8	1331.5	11180.4	5072.0	3774.3	2334.1
	Total	142325.0	28187.6	61360.0	52777.4	237174.1	35099.5	105042.7	97031.9

Table A16.2.2 GDP Estimate, High Assumption

(Unit: VND billion)

Region	Province	2010				2020			
		Total	Primary	Secondary	Tertiary	Total	Primary	Secondary	Tertiary
Red River Delta	Hanoi	41067.6	567.2	18910.5	21589.9	82952.1	357.6	39624.0	42970.5
	Haiphong	15015.1	1539.0	7000.5	6475.6	27986.2	1850.0	11507.2	14629.0
	Hai Duong	9842.5	1754.7	4573.8	3514.0	18502.8	1988.2	8908.4	7606.2
	Hung Yen	6277.5	1549.5	2507.2	2220.7	11796.3	1829.2	4773.9	5193.2
	Thai Binh	8562.3	2088.5	3172.3	3301.5	15996.5	2435.7	6217.1	7343.7
	Nam Dinh	8358.0	1163.1	3225.4	3969.5	15771.9	1325.8	6082.4	8367.7
	Ninh Binh	3180.6	750.5	1520.9	909.2	6054.7	961.2	3002.1	2091.4
	Ha Nam	3671.4	662.2	1461.0	1548.2	6681.6	739.3	2581.6	3360.7
	Ha Tay	11384.8	2371.7	5383.6	3629.5	21613.8	2979.1	10447.9	8186.7
	Subtotal	107359.9	12446.6	47755.2	47158.1	207355.9	14466.2	93144.7	99744.9
	North East	Cao Bang	2107.0	1067.1	319.3	720.6	3829.6	1665.1	694.8
Lang Son		2805.5	1284.2	479.9	1041.4	4895.9	1931.6	1017.1	1947.2
Quang Ninh		8384.8	529.0	3926.1	3929.7	17348.4	933.6	8194.3	8220.5
Thai Nguyen		3077.9	1063.1	1088.5	926.2	5384.9	1363.9	2269.9	1751.1
Bac Can		721.6	451.9	149.6	120.1	1304.2	777.1	336.8	190.3
Bac Ninh		4442.2	866.7	2156.1	1419.3	8140.7	1027.1	4191.4	2922.2
Bac Giang		4282.2	1499.6	1624.4	1158.2	7649.8	2511.1	3101.6	2037.2
Phu Tho		5774.5	1122.9	2369.1	2282.5	10984.7	1575.8	4875.4	4533.5
Vinh Phuc		4987.8	1568.7	961.3	2457.8	9235.1	2229.6	1966.6	5038.9
Lao Cai		1833.9	701.7	517.8	614.4	3416.1	1109.8	1129.3	1177.1
Yen Bai		2608.4	1066.2	1015.4	526.8	5030.2	1553.9	2445.2	1031.1
Tuyen Quang		2535.0	959.1	666.7	909.1	4918.3	1653.9	1548.4	1716.0
Ha Giang		1428.5	755.3	341.6	331.7	2780.7	1296.3	796.7	687.7
Subtotal		44989.2	12935.6	15615.9	16437.8	84918.7	19628.8	32567.4	32722.5
North West	Son La	2602.9	1694.8	527.6	380.5	4887.6	3051.2	1078.5	757.9
	Lai Chau	1727.4	506.9	744.0	476.5	3273.2	774.4	1546.9	952.0
	Hoa Binh	2987.4	1155.7	1039.6	792.0	5559.1	1946.1	2054.4	1558.6
	Subtotal	7317.7	3357.5	2311.2	1649.0	13719.9	5771.7	4679.8	3268.4
	Total	159666.8	28739.7	65882.3	65244.8	305994.5	39866.7	130392.0	135735.8

Table A16.2.3 GDP Estimate, Average

(Unit: VND billion)

Region	Province	2010				2020			
		Total	Primary	Secondary	Tertiary	Total	Primary	Secondary	Tertiary
Red River Delta	Hanoi	38683.9	570.1	18449.7	19664.1	73271.2	339.8	35944.9	36986.5
	Haiphong	14143.6	1531.9	4765.3	5846.4	24720.1	1753.0	10408.9	12558.2
	Hai Duong	9271.2	1733.1	4387.3	3150.8	16343.5	1868.1	7994.3	6481.1
	Hung Yen	5913.1	1526.8	2399.4	1986.9	10419.6	1717.3	4280.6	4421.7
	Thai Binh	8065.3	2062.6	3042.7	2960.0	14129.6	2289.4	5580.9	6259.3
	Nam Dinh	7872.8	1159.9	3123.0	3590.0	13931.3	1255.6	5499.2	7176.5
	Ninh Binh	2996.0	736.3	1449.4	810.3	5348.1	897.6	2678.2	1772.3
	Ha Nam	3458.3	657.0	1407.5	1393.8	5901.8	698.1	2327.6	2876.1
	Ha Tay	10724.0	2334.1	5146.1	3243.8	19091.4	2789.9	9346.2	6955.2
	Subtotal	101128.3	12311.8	46170.4	42646.1	183156.6	13608.8	84060.9	85486.9
	North East	Cao Bang	2005.0	1053.2	306.0	645.7	3426.4	1557.8	621.0
Lang Son		2669.7	1271.9	461.7	936.1	4380.4	1812.1	911.4	1656.9
Quang Ninh		7978.9	534.4	3849.1	3595.4	15521.8	895.1	7495.7	7131.0
Thai Nguyen		2928.9	1051.7	1045.7	831.6	4817.9	1283.6	2040.1	1494.2
Bac Can		686.6	439.2	141.3	106.1	1166.9	712.7	295.4	158.8
Bac Ninh		4227.1	862.5	2083.3	1281.2	7283.6	974.7	3796.9	2512.0
Bac Giang		4074.9	1480.1	1557.1	1037.7	6844.4	2347.0	2769.5	1727.8
Phu Tho		5495.0	1123.5	2301.1	2070.3	9828.1	1498.6	4425.3	3904.2
Vinh Phuc		4746.4	1574.4	936.5	2235.5	8262.8	2125.3	1789.0	4348.5
Lao Cai		1745.1	694.9	497.9	552.2	3056.5	1041.8	1012.5	1002.2
Yen Bai		2482.2	1045.6	967.3	469.3	4500.6	1449.1	2178.7	872.8
Tuyen Quang		2412.3	951.5	642.3	818.4	4400.4	1552.1	1387.8	1460.5
Ha Giang		1359.4	739.4	324.9	295.1	2487.9	1202.4	706.2	579.3
Subtotal		42811.5	12822.4	15114.2	14874.8	75977.6	18452.4	29429.4	28095.7
North West	Son La	2509.9	1666.3	503.8	339.7	4435.2	2837.1	958.3	639.8
	Lai Chau	1665.7	508.3	724.3	433.1	2970.3	739.0	1408.8	822.4
	Hoa Binh	2880.6	1154.7	1008.4	717.4	5044.6	1845.7	1859.9	1339.0
	Subtotal	7056.2	3329.4	2236.5	1490.2	12450.2	5421.8	4227.0	2801.3
	Total	150995.9	28463.6	63521.1	59011.1	271584.3	37483.1	117717.3	116383.8

Table A16.2.4 GDP Trend, 1995-2020

(Unit: VND billion)

Region	Province	Historical Trend						The Study Team		VITRANSS	
		1995	1996	1997	1998	1999	2000	2010	2020	2010	2020
Red River Delta	Hanoi	12,021.3	13,581.9	15,272.9	17,128.3	18,287.5	19,958.6	38,683.9	73,271.2	35,238.2	63,141.1
	Haiphong	5,022.3	5,441.6	5,978.9	6,903.3	7,339.5	8,008.9	14,143.6	24,720.1	13,636.6	22,739.5
	Hai Duong	3,231.2	3,619.6	4,066.1	4,430.2	4,598.6	5,035.0	9,271.2	16,343.5	8,848.4	16,873.8
	Hung Yen	1,347.7	1,871.0	2,125.0	2,341.9	2,681.2	2,978.2	5,913.1	10,419.6	4,794.1	8,660.6
	Thai Binh	3,595.4	3,760.4	4,164.0	4,186.8	4,420.1	4,580.3	8,065.3	14,129.6	10,377.1	18,848.2
	Nam Dinh	3,217.9	3,344.0	3,675.0	4,012.2	4,235.0	4,472.2	7,872.8	13,931.3	10,905.7	21,290.3
	Ninh Binh	1,164.7	1,242.7	1,423.0	1,523.7	1,616.6	1,721.1	2,996.0	5,348.1	3,245.7	5,889.2
	Ha Nam	1,255.2	1,305.3	1,423.0	1,553.9	1,734.9	1,875.1	3,458.3	5,901.8	3,912.1	7,357.5
	Ha Tay	3,431.7	3,809.7	4,109.6	4,778.4	5,098.6	5,455.5	10,724.0	19,091.4	10,170.7	18,356.6
Subtotal	34,287.4	37,976.2	42,237.5	46,858.7	50,012.0	54,084.9	101,128.3	183,156.6	101,128.3	183,156.6	
North East	Cao Bang	587.8	716.7	797.7	899.4	970.6	1,080.1	2,005.0	3,426.4	1,710.5	3,012.0
	Lang Son	1,201.1	1,343.5	1,480.2	1,501.5	1,610.5	1,731.1	2,669.7	4,380.4	2,548.1	4,531.3
	Quang Ninh	2,297.9	2,474.4	2,796.4	3,054.2	3,433.0	3,773.3	7,978.9	15,521.8	7,347.2	12,616.9
	Thai Nguyen	1,614.6	1,728.0	1,845.4	1,909.0	1,958.3	2,090.8	2,928.8	4,817.9	2,855.1	5,015.2
	Bac Can	265.9	280.3	313.9	354.1	382.1	410.2	686.6	1,166.9	616.3	1,175.0
	Bac Ninh	1,429.7	1,536.0	1,695.1	1,840.5	2,125.8	2,467.3	4,227.1	7,283.6	5,716.8	9,647.1
	Bac Giang	1,897.4	2,045.4	2,240.0	2,330.8	2,462.6	2,673.0	4,074.9	6,844.4	4,693.0	7,664.9
	Phu Tho	1,857.1	2,041.3	2,245.2	2,380.3	2,564.1	2,780.7	5,495.0	9,828.1	6,078.3	11,525.8
	Vinh Phuc	1,302.5	1,410.6	1,760.4	2,162.7	2,331.3	2,834.8	4,746.4	8,262.8	3,257.9	5,907.9
Lao Cai	547.6	576.8	606.8	840.4	899.1	955.0	1,745.1	3,056.5	2,337.3	4,487.6	
	Yen Bai	895.1	991.2	1,096.4	1,161.6	1,235.4	1,340.1	2,482.2	4,500.6	2,038.1	3,903.7
	Tuyen Quang	880.8	971.2	1,072.8	1,141.3	1,211.9	1,341.5	2,412.3	4,400.4	2,402.4	4,268.2
	Ha Giang	520.0	571.8	630.7	697.5	770.0	849.9	1,359.4	2,487.9	1,210.6	2,222.3
	Subtotal	15,297.5	16,687.2	18,581.0	20,273.3	21,954.7	24,327.8	42,811.5	75,977.6	42,811.5	75,977.6
North West	Son La	717.4	798.4	887.3	964.2	1,136.4	1,241.8	2,509.9	4,435.2	2,263.8	3,838.1
	Lai Chau	779.4	839.4	904.6	952.4	936.9	989.7	1,665.7	2,970.3	2,481.7	4,749.7
	Hoa Binh	970.8	1,038.1	1,127.6	1,335.4	1,425.1	1,560.5	2,880.6	5,044.6	2,310.7	3,862.4
	Subtotal	2,467.6	2,675.9	2,919.5	3,252.0	3,498.4	3,792.0	7,056.2	12,450.2	7,056.2	12,450.2
North Total	52,052.5	57,339.3	63,738.0	70,384.0	75,465.1	82,204.7	150,995.9	271,584.3	150,995.9	271,584.3	

Table A16.2.5 Province GDP Share to RRD Total

(Unit: %)

Region	Province	Historical Trend						The Study Team		VITRANSS	
		1995	1996	1997	1998	1999	2000	2010	2020	2010	2020
Red River Delta	Hanoi	35.1	35.8	36.2	36.6	36.6	36.9	38.3	40.0	34.8	34.5
	Haiphong	14.6	14.3	14.2	14.7	14.7	14.8	14.0	13.5	13.5	12.4
	Hai Duong	9.4	9.5	9.6	9.5	9.2	9.3	9.2	8.9	8.7	9.2
	Hung Yen	3.9	4.9	5.0	5.0	5.4	5.5	5.8	5.7	4.7	4.7
	Thai Binh	10.5	9.9	9.9	8.9	8.8	8.5	8.0	7.7	10.3	10.3
	Nam Dinh	9.4	8.8	8.7	8.6	8.5	8.3	7.8	7.6	10.8	11.6
	Ninh Binh	3.4	3.3	3.4	3.3	3.2	3.2	3.0	2.9	3.2	3.2
	Ha Nam	3.7	3.4	3.4	3.3	3.5	3.5	3.4	3.2	3.9	4.0
	Ha Tay	10.0	10.0	9.7	10.2	10.2	10.1	10.6	10.4	10.1	10.0
Subtotal	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
North East	Cao Bang	3.8	4.3	4.3	4.4	4.4	4.4	4.7	4.5	4.0	4.0
	Lang Son	7.9	8.1	8.0	7.4	7.3	7.1	6.2	5.8	6.0	6.0
	Quang Ninh	15.0	14.8	15.0	15.1	15.6	15.5	18.6	20.4	17.2	16.6
	Thai Nguyen	10.6	10.4	9.9	9.4	8.9	8.6	6.8	6.3	6.7	6.6
	Bac Can	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.5	1.4	1.5
	Bac Ninh	9.3	9.2	9.1	9.1	9.7	10.1	9.9	9.6	13.4	12.7
	Bac Giang	12.4	12.3	12.1	11.5	11.2	11.0	9.5	9.0	11.0	10.1
	Phu Tho	12.1	12.2	12.1	11.7	11.7	11.4	12.8	12.9	14.2	15.2
	Vinh Phuc	8.5	8.5	9.5	10.7	10.6	11.7	11.1	10.9	7.6	7.8
	Lao Cai	3.6	3.5	3.3	4.1	4.1	3.9	4.1	4.0	5.5	5.9
	Yen Bai	5.9	5.9	5.9	5.7	5.6	5.5	5.8	5.9	4.8	5.1
	Tuyen Quang	5.8	5.8	5.8	5.6	5.5	5.5	5.6	5.8	5.6	5.6
	Ha Giang	3.4	3.4	3.4	3.4	3.5	3.5	3.2	3.3	2.8	2.9
Subtotal	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
North West	Son La	29.1	29.8	30.4	29.6	32.5	32.7	35.6	35.6	32.1	30.8
	Lai Chau	31.6	31.4	31.0	29.3	26.8	26.1	23.6	23.9	35.2	38.1
	Hoa Binh	39.3	38.8	38.6	41.1	40.7	41.2	40.8	40.5	32.7	31.0
Subtotal	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Table A16.2.6 Production and Consumption of Stone

(unit: '000 tons)

Region	Province	1999		2010		2020	
		production	consumption	production	consumption	production	consumption
Red River Delta	Hanoi	50.0	1,361.6	90.4	2,484.8	112.1	6,161.4
	Haiphong	940.0	381.5	1,699.8	779.1	2,107.3	1,515.6
	Hai Duong	1,102.0	346.6	1,992.8	509.0	2,470.5	1,173.3
	Hung Yen	50.0	97.6	90.4	279.0	112.1	628.8
	Thai Binh	50.0	127.3	90.4	353.1	112.1	818.8
	Nam Dinh	50.0	161.0	90.4	359.0	112.1	801.1
	Ninh Binh	1,003.0	57.7	1,813.8	169.3	2,248.5	395.4
	Ha Nam	1,299.1	56.8	2,349.2	162.6	2,912.3	340.0
	Ha Tay	710.0	239.9	1,283.9	599.2	1,591.7	1,376.1
	Subtotal	5,254.1	2,830.0	9,501.3	5,695.1	11,778.7	13,210.4
North East	Cao Bang	11.9	18.8	21.5	41.2	26.7	53.9
	Lang Son	50.0	31.1	90.4	62.0	112.1	78.8
	Quang Ninh	50.0	304.7	90.4	506.9	112.1	635.2
	Thai Nguyen	231.2	132.4	418.1	140.5	518.3	176.0
	Bac Can	50.0	4.9	90.4	19.3	112.1	26.1
	Bac Ninh	50.0	78.9	90.4	278.4	112.1	324.9
	Bac Giang	50.0	71.7	90.4	209.7	112.1	240.4
	Phu Tho	50.0	165.0	90.4	305.9	112.1	378.0
	Vinh Phuc	50.0	75.5	90.4	124.1	112.1	152.5
	Lao Cai	50.0	31.8	90.4	66.8	112.1	87.5
	Yen Bai	50.0	37.7	90.4	131.1	112.1	189.6
	Tuyen Quang	50.0	29.0	90.4	86.1	112.1	120.0
	Ha Giang	50.0	20.6	90.4	44.1	112.1	61.8
	Subtotal	793.1	1,002.0	1,434.2	2,016.0	1,778.0	2,524.7
North West	Son La	50.0	56.2	90.4	108.4	112.1	137.1
	Lai Chau	25.0	76.4	45.2	152.9	56.0	196.6
	Hoa Binh	141.9	103.4	256.6	213.6	318.1	261.1
		Subtotal	216.9	236.0	392.2	474.9	486.3
Total		6,264.1	4,068.0	11,327.7	8,186.1	14,043.0	16,329.9

Table A16.2.7 Production and Consumption of Sand

(unit: '000 tons)

Region	Province	1999		2010		2020	
		production	consumption	production	consumption	production	consumption
Red River Delta	Hanoi	53.7	3,200.0	91.5	5,839.6	139.8	14,480.1
	Haiphong	87.7	509.5	149.4	1,040.7	228.3	2,024.3
	Hai Duong	2,315.0	462.9	3,944.7	679.9	6,026.6	1,567.2
	Hung Yen	1,150.0	130.3	1,959.6	372.7	2,993.8	839.8
	Thai Binh	1,507.0	170.0	2,567.9	471.6	3,923.2	1,093.7
	Nam Dinh	97.3	215.1	165.9	479.5	253.4	1,070.0
	Ninh Binh	80.9	77.1	137.9	226.1	210.6	528.1
	Ha Nam	48.0	75.9	81.8	217.2	125.0	454.2
	Ha Tay	125.2	320.5	213.3	800.3	325.9	1,838.0
	Subtotal	5,464.9	3,780.0	9,312.0	7,606.9	14,226.6	17,645.1
North East	Cao Bang	25.0	25.1	42.6	55.1	65.1	72.0
	Lang Son	477.5	41.5	813.6	82.8	1,243.0	105.4
	Quang Ninh	346.3	407.1	590.1	677.3	901.6	848.9
	Thai Nguyen	125.0	177.0	213.0	187.8	325.4	235.2
	Bac Can	42.6	6.5	72.6	25.8	110.9	34.9
	Bac Ninh	46.6	105.5	79.4	372.0	121.3	434.2
	Bac Giang	222.6	95.8	379.3	280.3	579.5	321.3
	Phu Tho	2,500.0	220.5	4,259.9	408.7	8,500.0	505.1
	Vinh Phuc	107.0	100.9	182.3	165.9	278.6	203.7
	Lao Cai	469.5	42.4	800.0	89.3	1,222.2	117.0
	Yen Bai	70.9	50.4	120.9	175.2	184.7	253.3
	Tuyen Quang	338.3	38.7	576.5	115.0	880.8	160.4
	Ha Giang	456.7	27.5	778.3	58.9	1,189.0	82.5
	Subtotal	4,178.6	1,339.0	7,120.2	2,694.1	10,878.1	3,373.9
North West	Son La	828.7	74.9	1,412.1	144.7	2,157.4	183.0
	Lai Chau	999.3	102.0	1,702.7	204.1	2,601.3	262.4
	Hoa Binh	127.0	138.1	216.4	285.1	330.6	348.5
		Subtotal	1,955.0	315.0	3,331.2	633.9	5,089.4
Total		11,598.4	5,434.0	19,763.4	10,934.9	30,194.1	21,812.8

Table A16.2.8 Production and Consumption of Cement

(unit: '000 tons)

Region	Province	1999		2010		2020	
		production	consumption	production	consumption	production	consumption
Red River Delta	Ha Noi	40.0	1,027.2	40.0	2,041.0	40.0	3,348.3
	Hai Phong	796.4	287.8	2,897.4	633.9	3,946.9	821.3
	Hai Duong	2,743.0	261.5	5,543.0	411.1	5,543.0	630.7
	Hung Yen		73.6	0.0	224.8	0.0	337.7
	Thai Binh	13.1	96.0	13.1	285.1	13.1	440.3
	Nam Dinh		121.5	0.0	292.6	0.0	433.9
	Ninh Binh	83.9	43.5	1,483.9	135.8	1,483.9	211.3
	Ha Nam	800.0	42.9	800.0	131.9	1,400.0	183.6
	Ha Tay	0.1	181.0	0.1	482.2	0.1	737.4
	Subtotal	3,748.7	2,135.0	10,049.7	4,638.4	11,503.7	7,144.6
North East	Cao Bang		14.2	0.0	33.3	0.0	53.4
	Lang Son		23.4	0.0	50.2	0.0	78.4
	Quang Ninh		229.9	2,800.0	418.4	2,800.0	644.5
	Thai Nguyen	109.7	99.9	109.7	113.7	109.7	175.4
	Bac Can		3.7	0.0	15.4	0.0	25.4
	Bac Ninh		59.6	0.0	226.4	0.0	326.5
	Bac Giang		54.1	0.0	169.2	0.0	238.1
	Phu Tho		124.5	0.0	250.1	0.0	380.5
	Vinh Phuc		57.0	0.0	101.8	0.0	153.8
	Lao Cai		24.0	0.0	54.1	0.0	87.1
	Yen Bai	44.0	28.5	44.0	105.1	44.0	187.3
	Tuyen Quang	55.4	21.9	55.4	69.8	55.4	119.3
	Ha Giang	17.5	15.5	17.5	35.3	17.5	60.7
Subtotal	226.6	756.0	3,026.6	1,642.8	3,026.6	2,530.4	
North West	Son La	8.8	42.4	458.8	87.1	458.8	135.0
	Lai Chau		57.6	0.0	125.2	0.0	198.4
	Hoa Binh	104.5	78.0	104.5	174.3	104.5	262.0
	Subtotal	113.3	178.0	563.3	386.5	563.3	595.4
Total		4,088.6	3,069.0	13,639.6	6,667.6	15,093.6	10,270.4

Table A16.2.9 Production and Consumption of Fertilizer

(unit: '000 tons)

Region	Province	1999		2010		2020	
		production	consumption	production	consumption	production	consumption
Red River Delta	Hanoi	192.0	80.0	200.0	47.8	400.0	28.4
	Haiphong		116.7	0.0	108.7	0.0	124.0
	Hai Duong		77.1	0.0	123.0	0.0	132.2
	Hung Yen		40.1	0.0	108.4	0.0	121.5
	Thai Binh		76.5	0.0	146.4	0.0	162.0
	Nam Dinh		67.8	0.0	82.3	0.0	88.8
	Ninh Binh	60.0	24.9	134.7	52.3	284.3	63.5
	Ha Nam		25.1	0.0	46.6	0.0	49.4
	Ha Tay		74.9	0.0	165.7	0.0	197.4
	Subtotal	232.1	818.5	290.0	881.1	590.0	967.3
North East	Cao Bang		14.8	0.0	79.9	0.0	118.2
	Lang Son		26.9	0.0	96.5	0.0	137.5
	Quang Ninh		58.2	300.0	40.5	500.0	67.9
	Thai Nguyen		34.7	0.0	79.8	0.0	97.4
	Bac Can		5.3	0.0	33.3	0.0	54.1
	Bac Ninh		32.1	0.0	65.4	0.0	74.0
	Bac Giang	133.6	42.2	340.0	112.3	460.0	178.1
	Phu Tho	0.0	44.0	0.0	85.2	0.0	113.7
	Vinh Phuc		33.7	0.0	119.5	0.0	161.2
	Lao Cai		15.3	0.0	52.7	0.0	79.0
	Yen Bai		20.3	0.0	79.3	0.0	109.9
	Tuyen Quang		19.1	0.0	72.2	0.0	117.8
	Ha Giang	0.9	9.6	0.0	56.1	0.0	91.2
Subtotal	790.4	356.2	1,640.0	972.9	2,460.0	1,400.0	
North West	Son La		19.4	0.0	126.4	0.0	215.3
	Lai Chau		16.0	0.0	38.6	0.0	56.1
	Hoa Binh		19.7	0.0	87.6	0.0	140.0
	Subtotal	0.0	55.0	0.0	252.6	0.0	411.4
Total		1,022.5	1,229.7	1,930.0	2,106.6	3,050.0	2,778.6

Table A16.2.10 Production and Consumption of Coal

(unit: '000 tons)

Region	Province	1999		2010		2020	
		production	consumption	production	consumption	production	consumption
Red River Delta	Hanoi		596.2	0.0	251.2	0.0	208.5
	Haiphong		484.0	0.0	220.7	0.0	231.5
	Hai Duong		2,800.0	0.0	2,531.7	0.0	3,010.8
	Hung Yen		72.1	0.0	60.6	0.0	59.1
	Thai Binh		121.9	0.0	97.3	0.0	97.3
	Nam Dinh		118.9	0.0	96.1	0.0	96.0
	Ninh Binh		1,032.9	0.0	190.7	0.0	568.7
	Ha Nam		146.3	0.0	137.7	0.0	127.3
	Ha Tay		156.6	0.0	123.9	0.0	116.4
	Subtotal	0.0	2,756.3	0.0	3,709.9	0.0	4,515.6
North East	Cao Bang		40.1	0.0	24.2	0.0	23.7
	Lang Son		43.6	0.0	29.7	0.0	27.6
	Quang Ninh	10,957.0	520.3	14,744.6	1,424.3	17,142.0	2,008.3
	Thai Nguyen	390.1	53.8	534.9	34.9	651.1	27.6
	Bac Can		14.0	0.0	12.2	0.0	12.4
	Bac Ninh		250.1	0.0	149.9	0.0	141.3
	Bac Giang		336.6	0.0	70.6	0.0	68.5
	Phu Tho		384.8	0.0	169.2	0.0	163.4
	Vinh Phuc		72.7	0.0	54.5	0.0	55.6
	Lao Cai		35.1	0.0	27.1	0.0	26.5
	Yen Bai		39.3	0.0	36.9	0.0	40.4
	Tuyen Quang		42.0	0.0	36.8	0.0	39.3
	Ha Giang		35.1	0.0	29.2	0.0	31.0
Subtotal	11,347.1	1,523.7	15,279.5	2,099.5	17,793.1	2,665.5	
North West	Son La	5.6	49.9	7.7	38.2	9.3	39.8
	Lai Chau	15.6	33.2	21.4	28.2	26.0	28.4
	Hoa Binh	17.4	44.9	23.9	37.9	29.0	37.6
	Subtotal	38.6	128.0	52.9	104.2	64.4	105.9
Total		11,385.7	4,407.9	15,332.4	5,913.7	17,857.5	7,287.0

Appendix 18 Transport Demand Forecast

As supporting and/or complementary data and information for **Chapter 18**, the following tables are provided in this Appendix:

Table A18.2.1	: OD tables of the total for the years 2001, 2010 and 2020
Table A18.2.2	: Ditto of constructions materials for the same years
Table A18.2.3	: Ditto of cement for the same years
Table A18.2.4	: Ditto of fertilizer for the same years
Table A18.2.5	: Ditto of coal
Table A18.2.6	: Ditto of others
Table A18.2.7	: Cargo flow in the Red River Hanoi Segment for the year 2001
Table A18.2.8	: Ditto for the year 2010
Table A18.2.9	: Ditto for the year 2020
Table A18.2.10	: Cargo throughput by province (assumption 0: No excluding)
Table A18.2.11	: Ditto (assumption 1: Excluding loading of coal)
Table A18.2.12	: Ditto (assumption 2: excluding loading of cement)
Table A18.2.13	: Ditto in the Northern Region (assumption 3: excluding loading of construction material and clay)
Table A18.2.14	: Ditto (assumption 4: excluding unloading of coal and others at Hai Duong)
Table A18.2.15	: Ditto (assumption 5: excluding unloading of coal and others at Ha Nam)
Table A18.2.16	: Ditto (assumption 6: excluding loading and unloading of all commodities at Hai Phong and Quang Ninh)
Table A18.2.17	: Ditto (assumption 7: excluding unloading of coal in Thai Binh)
Table A18.2.18	: Ditto (assumption 8: excluding loading/unloading of cargoes related to dam construction in Song La and Thuyen Quang)
Table A18.2.19	: Ditto (assumption 9: excluding intra movement of all cargoes)
Table A18.2.20	: Ditto (assumption 10: excluding all assumptions 1 – 9)

Table A18.2.4 OD Tables of Fertilizer

The Year 2001

OID	Hanoi	Hai Phong	Hai Duong	Hung Yen	Thai Binh	Nam Dinh	Ninh Binh	Ha Nam	Ha Tay	Cao Bang	Lang Son	Quang Ninh	Thai Nguyen	Bac Can	Bac Ninh	Bac Giang	Phu Tho	Vinh Phuc	Lao Cai	Yen Bai	Tuyen Quang	Ha Giang	Son La	Lai Chau	Hoa Binh	Total	(Unit : 1,000 tons/year)
Hanoi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	175
Hai Phong	0	0	2	4	0	25	15	0	10	0	0	0	0	0	0	36	33	0	0	0	0	0	0	0	0	0	125
Hai Duong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hung Yen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thai Binh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nam Dinh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ninh Binh	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10
Ha Nam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ha Tay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
Thai Nguyen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Giang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phu Tho	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vinh Phuc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lao Cai	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yen Bai	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuyen Quang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lai Chau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hoa Binh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	4	9	2	27	41	1	22	0	0	15	1	0	37	35	1	1	1	1	1	1	1	1	1	1	202

The Year 2010

OID	Hanoi	Hai Phong	Hai Duong	Hung Yen	Thai Binh	Nam Dinh	Ninh Binh	Ha Nam	Ha Tay	Cao Bang	Lang Son	Quang Ninh	Thai Nguyen	Bac Can	Bac Ninh	Bac Giang	Phu Tho	Vinh Phuc	Lao Cai	Yen Bai	Tuyen Quang	Ha Giang	Son La	Lai Chau	Hoa Binh	Total	(Unit : 1,000 tons/year)	
Hanoi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hai Phong	0	0	3	8	0	26	25	0	17	0	0	0	0	0	0	147	53	0	0	0	0	0	0	0	0	0	279	
Hai Duong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hung Yen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Thai Binh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nam Dinh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ninh Binh	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	
Ha Nam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ha Tay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Quang Ninh	0	0	0	0	0	0	25	0	17	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	
Thai Nguyen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bac Ninh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bac Giang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Phu Tho	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Vinh Phuc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lao Cai	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Yen Bai	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tuyen Quang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Son La	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lai Chau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hoa Binh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	1	5	19	4	28	63	1	38	0	0	31	1	0	149	55	2	2	2	2	2	2	2	2	2	2	371	

The Year 2020

OID	Hanoi	Hai Phong	Hai Duong	Hung Yen	Thai Binh	Nam Dinh	Ninh Binh	Ha Nam	Ha Tay	Cao Bang	Lang Son	Quang Ninh	Thai Nguyen	Bac Can	Bac Ninh	Bac Giang	Phu Tho	Vinh Phuc	Lao Cai	Yen Bai	Tuyen Quang	Ha Giang	Son La	Lai Chau	Hoa Binh	Total	(Unit : 1,000 tons/year)
Hanoi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hai Phong	0	0	3	10	0	32	33	0	23	0	0	0	0	0	0	265	67	0	0	0	0	0	0	0	0	0	433
Hai Duong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hung Yen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thai Binh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nam Dinh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ninh Binh	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
Ha Nam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ha Tay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	0	0	0	0	0	0	33	0	23	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112
Thai Nguyen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Can	0	0	0	0	0</																						

Table A18.2.7 Cargo Flow in the Red River Hanoi Segment, 2001

(a) Construction Materials

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		403	203	180	3,501	4,287
Downstream of Phu Dong		28	1,645	52	100	1,825
Downstream of Yen My		71	344	361	171	947
Hanoi Port Group		0	0	0	0	0
Total		502	2,193	593	3,772	7,060

(b) Cement

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		0	0	0	0	0
Downstream of Phu Dong		44	860	203	1,010	2,117
Downstream of Yen My		21	51	136	167	375
Hanoi Port Group		0	0	0	0	0
Total		65	911	339	1,177	2,493

(c) Fertilizer

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		0	0	0	0	0
Downstream of Phu Dong		30	93	70	0	192
Downstream of Yen My		0	0	10	0	10
Hanoi Port Group		0	0	0	0	0
Total		30	93	80	0	202

(d) Coal

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		0	0	0	0	0
Downstream of Phu Dong		582	3,719	1,314	500	6,115
Downstream of Yen My		0	0	0	0	0
Hanoi Port Group		0	0	0	0	0
Total		582	3,719	1,314	500	6,115

(e) Others

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		230	0	7	0	237
Downstream of Phu Dong		44	1,202	429	529	2,204
Downstream of Yen My		103	9	170	14	296
Hanoi Port Group		0	3	0	0	3
Total		377	1,214	606	543	2,740

(f) Total

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		633	203	187	3,501	4,525
Downstream of Phu Dong		728	7,520	2,067	2,139	12,454
Downstream of Yen My		195	404	677	353	1,628
Hanoi Port Group		0	3	0	0	3
Total		1,556	8,130	2,931	5,993	18,610

Table A18.2.8 Cargo Flow in the Red River Hanoi Segment, 2010

(a) Construction Materials

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		962	436	401	6,114	7,914
Downstream of Phu Dong		66	2,808	120	177	3,171
Downstream of Yen My		171	606	658	283	1,718
Hanoi Port Group		0	0	0	0	0
Total		1,199	3,850	1,179	6,574	12,803

(b) Cement

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		286	0	0	0	286
Downstream of Phu Dong		375	1,230	378	1,520	3,502
Downstream of Yen My		37	76	262	250	626
Hanoi Port Group		0	0	0	0	0
Total		698	1,306	641	1,769	4,414

(c) Fertilizer

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		0	0	0	0	0
Downstream of Phu Dong		59	242	102	0	403
Downstream of Yen My		0	0	13	0	13
Hanoi Port Group		0	0	0	0	0
Total		59	242	115	0	416

(d) Coal

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		0	0	0	0	0
Downstream of Phu Dong		511	6,698	2,589	698	10,497
Downstream of Yen My		0	0	0	0	0
Hanoi Port Group		0	0	0	0	0
Total		511	6,698	2,589	698	10,497

(e) Others

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		331	0	13	0	344
Downstream of Phu Dong		103	1,781	770	706	3,360
Downstream of Yen My		197	17	255	27	497
Hanoi Port Group		0	6	0	0	6
Total		630	1,804	1,039	733	4,207

(f) Total

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		1,579	436	415	6,114	8,545
Downstream of Phu Dong		1,114	12,759	3,960	3,100	20,933
Downstream of Yen My		405	699	1,188	560	2,853
Hanoi Port Group		0	6	0	0	6
Total		3,098	13,900	5,564	9,775	32,336

Table A18.2.9 Cargo Flow in the Red River Hanoi Segment, 2020**(a) Construction Materials**

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		1,475	744	891	10,106	13,216
Downstream of Phu Dong		76	4,229	279	267	4,851
Downstream of Yen My		196	775	1,289	657	2,917
Hanoi Port Group		0	0	0	0	0
Total		1,747	5,748	2,460	11,030	20,984

(b) Cement

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		286	0	0	0	286
Downstream of Phu Dong		728	1,926	720	2,924	6,297
Downstream of Yen My		358	148	476	484	1,466
Hanoi Port Group		0	0	0	0	0
Total		1,371	2,075	1,195	3,408	8,049

(c) Fertilizer

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		0	0	0	0	0
Downstream of Phu Dong		86	394	131	0	611
Downstream of Yen My		0	0	17	0	17
Hanoi Port Group		0	0	0	0	0
Total		86	394	148	0	628

(d) Coal

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		0	0	0	0	0
Downstream of Phu Dong		480	9,273	4,637	861	15,250
Downstream of Yen My		0	0	0	0	0
Hanoi Port Group		0	0	0	0	0
Total		480	9,273	4,637	861	15,250

(e) Others

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		490	0	20	0	510
Downstream of Phu Dong		161	2,616	1,439	884	5,099
Downstream of Yen My		291	25	378	40	735
Hanoi Port Group		0	9	0	0	9
Total		942	2,649	1,837	924	6,352

(f) Total

Origin	Destination	Upstream of Dong Lai	Downstream of Phu Dong	Downstream of Yen My	Hanoi Port Group	Total
Upstream of Dong Lai		2,251	744	911	10,106	14,011
Downstream of Phu Dong		1,531	18,438	7,205	4,936	32,109
Downstream of Yen My		845	948	2,160	1,181	5,134
Hanoi Port Group		0	9	0	0	9
Total		4,626	20,138	10,276	16,223	51,263

Table A18.2.10 Cargo Throughput by Province
Assumption 0: No excluding

(a) The Year 2001

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	3772	1177	0	500	543	5993	0	0	0	0	3	3	5996
Hai Phong	674	341	1	481	483	1980	288	785	125	0	1266	2463	4443
Hai Duong	369	227	4	2312	547	3458	1264	1332	0	0	417	3014	6472
Hung Yen	109	30	9	52	39	239	58	0	0	0	126	184	423
Thai Binh	149	148	2	86	62	447	75	0	0	0	46	120	567
Nam Dinh	184	78	27	91	125	505	46	0	0	0	52	99	604
Ninh Binh	73	65	41	926	173	1279	39	10	10	0	23	82	1360
Ha Nam	78	18	1	159	205	461	729	365	0	0	49	1143	1604
Ha Tay	106	21	22	115	72	336	65	0	0	0	61	127	463
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	872	288	15	522	35	1732	86	0	44	6115	291	6537	8268
Thai Nguyen	68	0	1	50	27	147	68	0	0	0	27	95	242
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	148	55	37	45	35	320	64	0	0	0	129	193	513
Bac Giang	62	0	35	310	87	494	55	0	23	0	74	152	646
Phu Tho	193	44	1	211	166	615	4027	0	0	0	32	4059	4674
Vinh Phuc	27	0	1	53	28	109	27	0	0	0	28	55	164
Lao Cai	13	0	1	29	16	59	13	0	0	0	16	29	87
Yen Bai	15	0	1	33	17	66	15	0	0	0	17	32	98
Tuyen Quang	14	0	1	33	17	65	27	0	0	0	17	45	110
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	24	0	1	43	23	92	24	0	0	0	23	47	139
Lai Chau	25	0	1	29	16	71	25	0	0	0	16	41	111
Hoa Binh	85	0	1	37	22	144	64	0	0	0	26	90	235
Total	7060	2493	202	6115	2740	18610	7060	2493	202	6115	2740	18610	37219

(b) The Year 2010

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	6574	1769	0	698	733	9775	0	0	0	0	6	6	9781
Hai Phong	1177	488	1	2094	806	4566	487	1196	279	0	1976	3939	8505
Hai Duong	517	247	5	3336	701	4804	2243	2306	0	0	440	4989	9793
Hung Yen	223	60	19	40	63	404	102	0	0	0	229	332	735
Thai Binh	300	288	4	843	98	1533	129	0	0	0	65	194	1727
Nam Dinh	332	128	28	70	217	775	67	0	0	0	77	144	919
Ninh Binh	153	131	63	1463	321	2131	70	19	13	0	32	135	2266
Ha Nam	171	34	1	174	340	720	1349	607	0	0	92	2048	2768
Ha Tay	190	37	38	88	108	462	104	0	0	0	88	192	653
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1496	430	31	855	54	2866	113	0	80	10497	546	11236	14103
Thai Nguyen	78	0	1	38	38	156	78	0	0	0	38	116	272
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	436	142	149	35	56	817	144	0	0	0	236	381	1197
Bac Giang	146	0	55	341	149	691	105	0	44	0	123	272	963
Phu Tho	407	90	2	227	271	997	7536	0	0	0	47	7582	8579
Vinh Phuc	33	0	2	40	40	116	33	0	0	0	40	74	189
Lao Cai	15	0	2	22	22	62	15	0	0	0	22	37	99
Yen Bai	20	0	2	25	25	73	20	0	0	0	25	45	118
Tuyen Quang	29	0	2	25	25	81	57	0	0	0	25	82	163
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	354	571	5	33	83	1046	34	0	0	0	33	67	1113
Lai Chau	33	0	1	22	22	80	33	0	0	0	22	56	135
Hoa Binh	118	0	4	28	32	182	82	286	0	0	41	410	592
Total	12803	4414	416	10497	4207	32336	12803	4414	416	10497	4207	32336	64673

(c) The Year 2020

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	11030	3408	0	861	924	16223	0	0	0	0	9	9	16231
Hai Phong	2247	590	1	3409	1193	7440	683	1956	433	0	3229	6301	13741
Hai Duong	830	353	6	4226	1017	6431	3667	4341	0	0	473	8481	14912
Hung Yen	455	112	23	31	93	714	182	0	0	0	339	522	1236
Thai Binh	634	557	5	1492	145	2832	237	0	0	0	97	334	3166
Nam Dinh	710	237	34	55	322	1358	118	0	0	0	114	233	1590
Ninh Binh	323	245	85	1820	476	2949	129	28	17	0	48	222	3170
Ha Nam	339	44	1	1237	802	2424	2249	1438	0	0	136	3824	6247
Ha Tay	382	72	50	70	161	734	184	0	0	0	130	314	1049
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1875	838	47	1193	80	4033	115	0	112	15250	809	16286	20319
Thai Nguyen	76	0	1	31	57	165	76	0	0	0	57	133	299
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	570	293	269	28	83	1243	185	0	0	0	350	535	1777
Bac Giang	150	0	69	387	220	826	125	0	67	0	182	374	1200
Phu Tho	427	158	4	253	385	1226	12715	0	0	0	69	12783	14010
Vinh Phuc	33	0	2	32	60	127	33	0	0	0	60	92	219
Lao Cai	14	0	3	18	33	69	14	0	0	0	33	47	116
Yen Bai	21	0	3	20	37	81	21	0	0	0	37	58	139
Tuyen Quang	353	571	4	20	87	1035	97	0	0	0	37	134	1169
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	357	571	10	26	99	1063	37	0	0	0	49	86	1150
Lai Chau	33	0	2	18	33	86	33	0	0	0	33	66	153
Hoa Binh	127	0	7	22	48	204	82	286	0	0	61	429	633
Total	20984	8049	628	15250	6352	51263	20984	8049	628	15250	6352	51263	102526

Table A 18.2.11 Cargo Throughput by Province
Assumption 1: Excluding loading of coal

(a) The Year 2001

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	3772	1177	0	500	543	5993	0	0	0	0	3	3	5996
Hai Phong	674	341	1	481	483	1980	288	785	125	0	1266	2463	4443
Hai Duong	369	227	4	2312	547	3458	1264	1332	0	0	417	3014	6472
Hung Yen	109	30	9	52	39	239	58	0	0	0	126	184	423
Thai Binh	149	148	2	86	62	447	75	0	0	0	46	120	567
Nam Dinh	184	78	27	91	125	505	46	0	0	0	52	99	604
Ninh Binh	73	65	41	926	173	1279	39	10	10	0	23	82	1360
Ha Nam	78	18	1	159	205	461	729	365	0	0	49	1143	1604
Ha Tay	106	21	22	115	72	336	65	0	0	0	61	127	463
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	872	288	15	522	35	1732	86	0	44	0	291	421	2153
Thai Nguyen	68	0	1	50	27	147	68	0	0	0	27	95	242
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	148	55	37	45	35	320	64	0	0	0	129	193	513
Bac Giang	62	0	35	310	87	494	55	0	23	0	74	152	646
Phu Tho	193	44	1	211	166	615	4027	0	0	0	32	4059	4674
Vinh Phuc	27	0	1	53	28	109	27	0	0	0	28	55	164
Lao Cai	13	0	1	29	16	59	13	0	0	0	16	29	87
Yen Bai	15	0	1	33	17	66	15	0	0	0	17	32	98
Tuyen Quang	14	0	1	33	17	65	27	0	0	0	17	45	110
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	24	0	1	43	23	92	24	0	0	0	23	47	139
Lai Chau	25	0	1	29	16	71	25	0	0	0	16	41	111
Hoa Binh	85	0	1	37	22	144	64	0	0	0	26	90	235
Total	7060	2493	202	6115	2740	18610	7060	2493	202	0	2740	12494	31104

(b) The Year 2010

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	6574	1769	0	698	733	9775	0	0	0	0	6	6	9781
Hai Phong	1177	488	1	2094	806	4566	487	1196	279	0	1976	3939	8505
Hai Duong	517	247	5	3336	701	4804	2243	2306	0	0	440	4989	9793
Hung Yen	223	60	19	40	63	404	102	0	0	0	229	332	735
Thai Binh	300	288	4	843	98	1533	129	0	0	0	65	194	1727
Nam Dinh	332	128	28	70	217	775	67	0	0	0	77	144	919
Ninh Binh	153	131	63	1463	321	2131	70	19	13	0	32	135	2266
Ha Nam	171	34	1	174	340	720	1349	607	0	0	92	2048	2768
Ha Tay	190	37	38	88	108	462	104	0	0	0	88	192	653
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1496	430	31	855	54	2866	113	0	80	0	546	740	3606
Thai Nguyen	78	0	1	38	38	156	78	0	0	0	38	116	272
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	436	142	149	35	56	817	144	0	0	0	236	381	1197
Bac Giang	146	0	55	341	149	691	105	0	44	0	123	272	963
Phu Tho	407	90	2	227	271	997	7536	0	0	0	47	7582	8579
Vinh Phuc	33	0	2	40	40	116	33	0	0	0	40	74	189
Lao Cai	15	0	2	22	22	62	15	0	0	0	22	37	99
Yen Bai	20	0	2	25	25	73	20	0	0	0	25	45	118
Tuyen Quang	29	0	2	25	25	81	57	0	0	0	25	82	163
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	354	571	5	33	83	1046	34	0	0	0	33	67	1113
Lai Chau	33	0	1	22	22	80	33	0	0	0	22	56	135
Hoa Binh	118	0	4	28	32	182	82	286	0	0	41	410	592
Total	12803	4414	416	10497	4207	32336	12803	4414	416	0	4207	21840	54176

(c) The Year 2020

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	11030	3408	0	861	924	16223	0	0	0	0	9	9	16231
Hai Phong	2247	590	1	3409	1193	7440	683	1956	433	0	3229	6301	13741
Hai Duong	830	353	6	4226	1017	6431	3667	4341	0	0	473	8481	14912
Hung Yen	455	112	23	31	93	714	182	0	0	0	339	522	1236
Thai Binh	634	557	5	1492	145	2832	237	0	0	0	97	334	3166
Nam Dinh	710	237	34	55	322	1358	118	0	0	0	114	233	1590
Ninh Binh	323	245	85	1820	476	2949	129	28	17	0	48	222	3170
Ha Nam	339	44	1	1237	802	2424	2249	1438	0	0	136	3824	6247
Ha Tay	382	72	50	70	161	734	184	0	0	0	130	314	1049
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1875	838	47	1193	80	4033	115	0	112	0	809	1036	5069
Thai Nguyen	76	0	1	31	57	165	76	0	0	0	57	133	299
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	570	293	269	28	83	1243	185	0	0	0	350	535	1777
Bac Giang	150	0	69	387	220	826	125	0	67	0	182	374	1200
Phu Tho	427	158	4	253	385	1226	12715	0	0	0	69	12783	14010
Vinh Phuc	33	0	2	32	60	127	33	0	0	0	60	92	219
Lao Cai	14	0	3	18	33	69	14	0	0	0	33	47	116
Yen Bai	21	0	3	20	37	81	21	0	0	0	37	58	139
Tuyen Quang	353	571	4	20	87	1035	97	0	0	0	37	134	1169
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	357	571	10	26	99	1063	37	0	0	0	49	86	1150
Lai Chau	33	0	2	18	33	86	33	0	0	0	33	66	153
Hoa Binh	127	0	7	22	48	204	82	286	0	0	61	429	633
Total	20984	8049	628	15250	6352	51263	20984	8049	628	0	6352	36013	87276

Table A18.2.12 Cargo Throughput by Province
Assumption 2: Excluding loading of cement except Ninh Binh

(a) The Year 2001

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	3772	1177	0	500	543	5993	0	0	0	0	3	3	5996
Hai Phong	674	341	1	481	483	1980	288	0	125	0	1266	1678	3658
Hai Duong	369	227	4	2312	547	3458	1264	0	0	0	417	1682	5140
Hung Yen	109	30	9	52	39	239	58	0	0	0	126	184	423
Thai Binh	149	148	2	86	62	447	75	0	0	0	46	120	567
Nam Dinh	184	78	27	91	125	505	46	0	0	0	52	99	604
Ninh Binh	73	65	41	926	173	1279	39	10	10	0	23	82	1360
Ha Nam	78	18	1	159	205	461	729	0	0	0	49	778	1239
Ha Tay	106	21	22	115	72	336	65	0	0	0	61	127	463
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	872	288	15	522	35	1732	86	0	44	6115	291	6537	8268
Thai Nguyen	68	0	1	50	27	147	68	0	0	0	27	95	242
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	148	55	37	45	35	320	64	0	0	0	129	193	513
Bac Giang	62	0	35	310	87	494	55	0	23	0	74	152	646
Phu Tho	193	44	1	211	166	615	4027	0	0	0	32	4059	4674
Vinh Phuc	27	0	1	53	28	109	27	0	0	0	28	55	164
Lao Cai	13	0	1	29	16	59	13	0	0	0	16	29	87
Yen Bai	15	0	1	33	17	66	15	0	0	0	17	32	98
Tuyen Quang	14	0	1	33	17	65	27	0	0	0	17	45	110
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	24	0	1	43	23	92	24	0	0	0	23	47	139
Lai Chau	25	0	1	29	16	71	25	0	0	0	16	41	111
Hoa Binh	85	0	1	37	22	144	64	0	0	0	26	90	235
Total	7060	2493	202	6115	2740	18610	7060	10	202	6115	2740	16127	34736

(b) The Year 2010

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	6574	1769	0	698	733	9775	0	0	0	0	6	6	9781
Hai Phong	1177	488	1	2094	806	4566	487	0	279	0	1976	2743	7309
Hai Duong	517	247	5	3336	701	4804	2243	0	0	0	440	2683	7487
Hung Yen	223	60	19	40	63	404	102	0	0	0	229	332	735
Thai Binh	300	288	4	843	98	1533	129	0	0	0	65	194	1727
Nam Dinh	332	128	28	70	217	775	67	0	0	0	77	144	919
Ninh Binh	153	131	63	1463	321	2131	70	19	13	0	32	135	2266
Ha Nam	171	34	1	174	340	720	1349	0	0	0	92	1441	2161
Ha Tay	190	37	38	88	108	462	104	0	0	0	88	192	653
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1496	430	31	855	54	2866	113	0	80	10497	546	11236	14103
Thai Nguyen	78	0	1	38	38	156	78	0	0	0	38	116	272
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	436	142	149	35	56	817	144	0	0	0	236	381	1197
Bac Giang	146	0	55	341	149	691	105	0	44	0	123	272	963
Phu Tho	407	90	2	227	271	997	7536	0	0	0	47	7582	8579
Vinh Phuc	33	0	2	40	40	116	33	0	0	0	40	74	189
Lao Cai	15	0	2	22	22	62	15	0	0	0	22	37	99
Yen Bai	20	0	2	25	25	73	20	0	0	0	25	45	118
Tuyen Quang	29	0	2	25	25	81	57	0	0	0	25	82	163
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	354	571	5	33	83	1046	34	0	0	0	33	67	1113
Lai Chau	33	0	1	22	22	80	33	0	0	0	22	56	135
Hoa Binh	118	0	4	28	32	182	82	0	0	0	41	124	306
Total	12803	4414	416	10497	4207	32336	12803	19	416	10497	4207	27941	60277

(c) The Year 2020

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	11030	3408	0	861	924	16223	0	0	0	0	9	9	16231
Hai Phong	2247	590	1	3409	1193	7440	683	0	433	0	3229	4345	11785
Hai Duong	830	353	6	4226	1017	6431	3667	0	0	0	473	4139	10570
Hung Yen	455	112	23	31	93	714	182	0	0	0	339	522	1236
Thai Binh	634	557	5	1492	145	2832	237	0	0	0	97	334	3166
Nam Dinh	710	237	34	55	322	1358	118	0	0	0	114	233	1590
Ninh Binh	323	245	85	1820	476	2949	129	28	17	0	48	222	3170
Ha Nam	339	44	1	1237	802	2424	2249	0	0	0	136	2386	4809
Ha Tay	382	72	50	70	161	734	184	0	0	0	130	314	1049
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1875	838	47	1193	80	4033	115	0	112	15250	809	16286	20319
Thai Nguyen	76	0	1	31	57	165	76	0	0	0	57	133	299
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	570	293	269	28	83	1243	185	0	0	0	350	535	1777
Bac Giang	150	0	69	387	220	826	125	0	67	0	182	374	1200
Phu Tho	427	158	4	253	385	1226	12715	0	0	0	69	12783	14010
Vinh Phuc	33	0	2	32	60	127	33	0	0	0	60	92	219
Lao Cai	14	0	3	18	33	69	14	0	0	0	33	47	116
Yen Bai	21	0	3	20	37	81	21	0	0	0	37	58	139
Tuyen Quang	353	571	4	20	87	1035	97	0	0	0	37	134	1169
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	357	571	10	26	99	1063	37	0	0	0	49	86	1150
Lai Chau	33	0	2	18	33	86	33	0	0	0	33	66	153
Hoa Binh	127	0	7	22	48	204	82	0	0	0	61	143	347
Total	20984	8049	628	15250	6352	51263	20984	28	628	15250	6352	43242	94505

Table A 18.2.13 Cargo Throughput by Province in the Northern Region
Assumption 3: Excluding loading of construction material and clay

(a) The Year 2001

(Unit: 1,000 tons/year)

	Unloading						Loading						Total	
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total		
Hanoi	3772	1177	0	500	543	5993	0	0	0	0	3	3	5996	
Hai Phong	674	341	1	481	483	1980	0	785	125	0	0	1266	2176	4156
Hai Duong	369	227	4	2312	547	3458	0	1332	0	0	46	1378	4837	
Hung Yen	109	30	9	52	39	239	0	0	0	0	126	126	366	
Thai Binh	149	148	2	86	62	447	0	0	0	0	46	46	493	
Nam Dinh	184	78	27	91	125	505	0	0	0	0	52	52	557	
Ninh Binh	73	65	41	926	173	1279	0	10	10	0	23	43	1321	
Ha Nam	78	18	1	159	205	461	0	365	0	0	49	414	875	
Ha Tay	106	21	22	115	72	336	0	0	0	0	61	61	397	
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0	
Quang Ninh	872	288	15	522	35	1732	0	0	44	6115	291	6451	8183	
Thai Nguyen	68	0	1	50	27	147	0	0	0	0	27	27	173	
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bac Ninh	148	55	37	45	35	320	0	0	0	0	129	129	449	
Bac Giang	62	0	35	310	87	494	0	0	23	0	74	97	591	
Phu Tho	193	44	1	211	164	615	0	0	0	0	32	32	647	
Vinh Phuc	27	0	1	53	28	109	0	0	0	0	28	28	137	
Lao Cai	13	0	1	29	16	59	0	0	0	0	16	16	74	
Yen Bai	15	0	1	33	17	66	0	0	0	0	17	17	83	
Tuyen Quang	14	0	1	33	17	65	0	0	0	0	17	17	82	
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0	
Son La	24	0	1	43	23	92	0	0	0	0	23	23	115	
Lai Chau	25	0	1	29	16	71	0	0	0	0	16	16	86	
Hoa Binh	85	0	1	37	22	144	0	0	0	0	26	26	171	
Total	7060	2493	202	6115	2740	18610	0	2493	202	6115	2369	11179	29788	

(b) The Year 2010

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	6574	1769	0	698	733	9775	0	0	0	0	6	6	9781
Hai Phong	1177	488	1	2094	806	4566	0	1196	279	0	1976	3452	8018
Hai Duong	517	247	5	3336	701	4804	0	2306	0	0	69	2375	7179
Hung Yen	223	60	19	40	63	404	0	0	0	0	229	229	633
Thai Binh	300	288	4	843	98	1533	0	0	0	0	65	65	1598
Nam Dinh	332	128	28	70	217	775	0	0	0	0	77	77	852
Ninh Binh	153	131	63	1463	321	2131	0	19	13	0	32	64	2196
Ha Nam	171	34	1	174	340	720	0	607	0	0	92	699	1419
Ha Tay	190	37	38	88	108	462	0	0	0	0	88	88	550
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1496	430	31	855	54	2866	0	0	80	10497	546	11123	13989
Thai Nguyen	78	0	1	38	38	156	0	0	0	0	38	38	194
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	436	142	149	35	56	817	0	0	0	0	236	236	1053
Bac Giang	146	0	55	341	149	691	0	44	0	0	123	167	858
Phu Tho	407	90	2	227	271	997	0	0	0	0	47	47	1043
Vinh Phuc	33	0	2	40	40	116	0	0	0	0	40	40	156
Lao Cai	15	0	2	22	22	62	0	0	0	0	22	22	84
Yen Bai	20	0	2	25	25	73	0	0	0	0	25	25	98
Tuyen Quang	29	0	2	25	25	81	0	0	0	0	25	25	107
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	354	571	5	33	83	1046	0	0	0	0	33	33	1080
Lai Chau	33	0	1	22	22	80	0	0	0	0	22	22	102
Hoa Binh	118	0	4	28	32	182	0	286	0	0	41	327	509
Total	12803	4414	416	10497	4207	32336	0	4414	416	10497	3836	19162	51499

(c) The Year 2020

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	11030	3408	0	861	924	16223	0	0	0	0	9	9	16231
Hai Phong	2247	590	1	3409	1193	7440	0	1956	433	0	3229	5618	13058
Hai Duong	830	353	6	4226	1017	6431	0	4341	0	0	102	4443	10874
Hung Yen	455	112	23	31	93	714	0	0	0	0	339	339	1054
Thai Binh	634	557	5	1492	145	2832	0	0	0	0	97	97	2929
Nam Dinh	710	237	34	55	322	1358	0	0	0	0	114	114	1472
Ninh Binh	323	245	85	1820	476	2949	0	28	17	0	48	92	3041
Ha Nam	339	44	1	1237	802	2424	0	1438	0	0	136	1574	3998
Ha Tay	382	72	50	70	161	734	0	0	0	0	130	130	865
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1875	838	47	1193	80	4033	0	0	112	15250	809	16171	20204
Thai Nguyen	76	0	1	31	57	165	0	0	0	0	57	57	222
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	570	293	249	28	83	1243	0	0	0	0	350	350	1592
Bac Giang	150	0	69	387	220	826	0	0	67	0	182	249	1075
Phu Tho	427	158	4	253	385	1226	0	0	0	0	69	69	1295
Vinh Phuc	33	0	2	32	60	127	0	0	0	0	60	60	186
Lao Cai	14	0	3	18	33	69	0	0	0	0	33	33	102
Yen Bai	21	0	3	20	37	81	0	0	0	0	37	37	118
Tuyen Quang	353	571	4	20	87	1035	0	0	0	0	37	37	1072
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	357	571	10	26	99	1063	0	0	0	0	49	49	1112
Lai Chau	33	0	2	18	33	86	0	0	0	0	33	33	120
Hoa Binh	127	0	7	22	48	204	0	286	0	0	61	347	551
Total	20984	8049	628	15250	6352	51263	0	8049	628	15250	5981	29908	81172

Table A 18.2.14 Cargo Throughput by Province

Assumption 4: Excluding unloading of coal and others at Hai Duong(Pha Lai + Hoang Thach)

(a) The Year 2001

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	3772	1177	0	500	543	5993	0	0	0	0	3	3	5996
Hai Phong	674	341	1	481	483	1980	288	785	125	0	1266	2463	4443
Hai Duong	369	227	4	80	152	831	1264	1332	0	0	417	3014	3845
Hung Yen	109	30	9	52	39	239	58	0	0	0	126	184	423
Thai Binh	149	148	2	86	62	447	75	0	0	0	46	120	567
Nam Dinh	184	78	27	91	125	505	46	0	0	0	52	99	604
Ninh Binh	73	65	41	926	173	1279	39	10	10	0	23	82	1360
Ha Nam	78	18	1	159	205	461	729	365	0	0	49	1143	1604
Ha Tay	106	21	22	115	72	336	65	0	0	0	61	127	463
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	872	288	15	522	35	1732	86	0	44	6115	291	6537	8268
Thai Nguyen	68	0	1	50	27	147	68	0	0	0	27	95	242
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	148	55	37	45	35	320	64	0	0	0	129	193	513
Bac Giang	62	0	35	310	87	494	55	0	23	0	74	152	646
Phu Tho	193	44	1	211	166	615	4027	0	0	0	32	4059	4674
Vinh Phuc	27	0	1	53	28	109	27	0	0	0	28	55	164
Lao Cai	13	0	1	29	16	59	13	0	0	0	16	29	87
Yen Bai	15	0	1	33	17	66	15	0	0	0	17	32	98
Tuyen Quang	14	0	1	33	17	65	27	0	0	0	17	45	110
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	24	0	1	43	23	92	24	0	0	0	23	47	139
Lai Chau	25	0	1	29	16	71	25	0	0	0	16	41	111
Hoa Binh	85	0	1	37	22	144	64	0	0	0	26	90	235
Total	7060	2493	202	3883	2345	15983	7060	2493	202	6115	2740	18610	34592

(b) The Year 2010

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	6574	1769	0	698	733	9775	0	0	0	0	6	6	9781
Hai Phong	1177	488	1	2094	806	4566	487	1196	279	0	1976	3939	8505
Hai Duong	517	247	5	61	272	1101	2243	2306	0	0	440	4989	6090
Hung Yen	223	60	19	40	63	404	102	0	0	0	229	332	735
Thai Binh	300	288	4	843	98	1533	129	0	0	0	65	194	1727
Nam Dinh	332	128	28	70	217	775	67	0	0	0	77	144	919
Ninh Binh	153	131	63	1463	321	2131	70	19	13	0	32	135	2266
Ha Nam	171	34	1	174	340	720	1349	607	0	0	92	2048	2768
Ha Tay	190	37	38	88	108	462	104	0	0	0	88	192	653
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1496	430	31	855	54	2866	113	0	80	10497	546	11236	14103
Thai Nguyen	78	0	1	38	38	156	78	0	0	0	38	116	272
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	436	142	149	35	56	817	144	0	0	0	236	381	1197
Bac Giang	146	0	55	341	149	691	105	0	44	0	123	272	963
Phu Tho	407	90	2	227	271	997	7536	0	0	0	47	7582	8579
Vinh Phuc	33	0	2	40	40	116	33	0	0	0	40	74	189
Lao Cai	15	0	2	22	22	62	15	0	0	0	22	37	99
Yen Bai	20	0	2	25	25	73	20	0	0	0	25	45	118
Tuyen Quang	29	0	2	25	25	81	57	0	0	0	25	82	163
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	354	571	5	33	83	1046	34	0	0	0	33	67	1113
Lai Chau	33	0	1	22	22	80	33	0	0	0	22	56	135
Hoa Binh	118	0	4	28	32	182	82	286	0	0	41	410	592
Total	12803	4414	416	7222	3778	28633	12803	4414	416	10497	4207	32336	60969

(c) The Year 2020

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	11030	3408	0	861	924	16223	0	0	0	0	9	9	16231
Hai Phong	2247	590	1	3409	1193	7440	683	1956	433	0	3229	6301	13741
Hai Duong	830	353	6	49	403	1639	3667	4341	0	0	473	8481	10120
Hung Yen	455	112	23	31	93	714	182	0	0	0	339	522	1236
Thai Binh	634	557	5	1492	145	2832	237	0	0	0	97	334	3166
Nam Dinh	710	237	34	55	322	1358	118	0	0	0	114	233	1590
Ninh Binh	323	245	85	1820	476	2949	129	28	17	0	48	222	3170
Ha Nam	339	44	1	1237	802	2424	2249	1438	0	0	136	3824	6247
Ha Tay	382	72	50	70	161	734	184	0	0	0	130	314	1049
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1875	838	47	1193	80	4033	115	0	112	15250	809	16286	20319
Thai Nguyen	76	0	1	31	57	165	76	0	0	0	57	133	299
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	570	293	269	28	83	1243	185	0	0	0	350	535	1777
Bac Giang	150	0	69	387	220	826	125	0	67	0	182	374	1200
Phu Tho	427	158	4	253	385	1226	12715	0	0	0	69	12783	14010
Vinh Phuc	33	0	2	32	60	127	33	0	0	0	60	92	219
Lao Cai	14	0	3	18	33	69	14	0	0	0	33	47	116
Yen Bai	21	0	3	20	37	81	21	0	0	0	37	58	139
Tuyen Quang	353	571	4	20	87	1035	97	0	0	0	37	134	1169
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	357	571	10	26	99	1063	37	0	0	0	49	86	1150
Lai Chau	33	0	2	18	33	86	33	0	0	0	33	66	153
Hoa Binh	127	0	7	22	48	204	82	286	0	0	61	429	633
Total	20984	8049	628	11073	5738	46471	20984	8049	628	15250	6352	51263	97735

Table A18.2.15 Cargo Throughput by Province
Assumption 5: Excluding unloading of coal and others at Ha Nam(But Son)

(a) The Year 2001

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	3772	1177	0	500	543	5993	0	0	0	0	3	3	5996
Hai Phong	674	341	1	481	483	1980	288	785	125	0	1266	2463	4443
Hai Duong	369	227	4	2312	547	3458	1264	1332	0	0	417	3014	6472
Hung Yen	109	30	9	52	39	239	58	0	0	0	126	184	423
Thai Binh	149	148	2	86	62	447	75	0	0	0	46	120	567
Nam Dinh	184	78	27	91	125	505	46	0	0	0	52	99	604
Ninh Binh	73	65	41	924	173	1279	39	10	10	0	23	82	1360
Ha Nam	78	18	1	38	3	138	729	365	0	0	49	1143	1281
Ha Tay	106	21	22	115	72	336	65	0	0	0	61	127	463
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	872	288	15	522	35	1732	86	0	44	6115	291	6537	8268
Thai Nguyen	68	0	1	50	27	147	68	0	0	0	27	95	242
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	148	55	37	45	35	320	64	0	0	0	129	193	513
Bac Giang	62	0	35	310	87	494	55	0	23	0	74	152	646
Phu Tho	193	44	1	211	166	615	4027	0	0	0	32	4059	4674
Vinh Phuc	27	0	1	53	28	109	27	0	0	0	28	55	164
Lao Cai	13	0	1	29	16	59	13	0	0	0	16	29	87
Yen Bai	15	0	1	33	17	66	15	0	0	0	17	32	98
Tuyen Quang	14	0	1	33	17	65	27	0	0	0	17	45	110
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	24	0	1	43	23	92	24	0	0	0	23	47	139
Lai Chau	25	0	1	29	16	71	25	0	0	0	16	41	111
Hoa Binh	85	0	1	37	22	144	64	0	0	0	26	90	235
Total	7060	2493	202	5994	2538	18287	7060	2493	202	6115	2740	18610	36896

(b) The Year 2010

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	6574	1769	0	698	733	9775	0	0	0	0	6	6	9781
Hai Phong	1177	488	1	2094	806	4566	487	1196	279	0	1976	3939	8505
Hai Duong	517	247	5	3336	701	4804	2243	2306	0	0	440	4989	9793
Hung Yen	223	60	19	40	63	404	102	0	0	0	229	332	735
Thai Binh	300	288	4	843	98	1533	129	0	0	0	65	194	1727
Nam Dinh	332	128	28	70	217	775	67	0	0	0	77	144	919
Ninh Binh	153	131	63	1463	321	2131	70	19	13	0	32	135	2266
Ha Nam	171	34	1	29	5	240	1349	607	0	0	92	2048	2287
Ha Tay	190	37	38	88	108	462	104	0	0	0	88	192	653
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1496	430	31	855	54	2866	113	0	80	10497	546	11236	14103
Thai Nguyen	78	0	1	38	38	156	78	0	0	0	38	116	272
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	436	142	149	35	56	817	144	0	0	0	236	381	1197
Bac Giang	146	0	55	341	149	691	105	0	44	0	123	272	963
Phu Tho	407	90	2	227	271	997	7536	0	0	0	47	7582	8579
Vinh Phuc	33	0	2	40	40	116	33	0	0	0	40	74	189
Lao Cai	15	0	2	22	22	62	15	0	0	0	22	37	99
Yen Bai	20	0	2	25	25	73	20	0	0	0	25	45	118
Tuyen Quang	29	0	2	25	25	81	57	0	0	0	25	82	163
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	354	571	5	33	83	1046	34	0	0	0	33	67	1113
Lai Chau	33	0	1	22	22	80	33	0	0	0	22	56	135
Hoa Binh	118	0	4	28	32	182	82	286	0	0	41	410	592
Total	12803	4414	416	10351	3871	31854	12803	4414	416	10497	4207	32336	64192

(c) The Year 2020

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	11030	3408	0	861	924	16223	0	0	0	0	9	9	16231
Hai Phong	2247	590	1	3409	1193	7440	683	1956	433	0	3229	6301	13741
Hai Duong	830	353	6	4226	1017	6431	3667	4341	0	0	473	8481	14912
Hung Yen	455	112	23	31	93	714	182	0	0	0	339	522	1236
Thai Binh	634	557	5	1492	145	2832	237	0	0	0	97	334	3166
Nam Dinh	710	237	34	55	322	1358	118	0	0	0	114	233	1590
Ninh Binh	323	245	85	1820	476	2949	129	28	17	0	48	222	3170
Ha Nam	339	44	1	23	7	414	2249	1438	0	0	136	3824	4238
Ha Tay	382	72	50	70	161	734	184	0	0	0	130	314	1049
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1875	838	47	1193	80	4033	115	0	112	15250	809	16286	20319
Thai Nguyen	76	0	1	31	57	165	76	0	0	0	57	133	299
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	570	293	269	28	83	1243	185	0	0	0	350	535	1777
Bac Giang	150	0	69	387	220	826	125	0	67	0	182	374	1200
Phu Tho	427	158	4	253	385	1226	12715	0	0	0	69	12783	14010
Vinh Phuc	33	0	2	32	60	127	33	0	0	0	60	92	219
Lao Cai	14	0	3	18	33	69	14	0	0	0	33	47	116
Yen Bai	21	0	3	20	37	81	21	0	0	0	37	58	139
Tuyen Quang	353	571	4	20	87	1035	97	0	0	0	37	134	1169
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	357	571	10	26	99	1063	37	0	0	0	49	86	1150
Lai Chau	33	0	2	18	33	86	33	0	0	0	33	66	153
Hoa Binh	127	0	7	22	48	204	82	286	0	0	61	429	633
Total	20984	8049	628	14036	5557	49254	20984	8049	628	15250	6352	51263	100517

Table A18.2.16 Cargo Throughput by Province

Assumption 6: Excluding loading and unloading of all commodities at Hai Phong and Quang Ninh

(a) The Year 2001

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	3772	1177	0	500	543	5993	0	0	0	0	3	3	5996
Hai Phong	0	0	0	0	0	0	0	0	0	0	0	0	0
Hai Duong	369	227	4	2312	547	3458	1264	1332	0	0	417	3014	6472
Hung Yen	109	30	9	52	39	239	58	0	0	0	126	184	423
Thai Binh	149	148	2	86	62	447	75	0	0	0	46	120	567
Nam Dinh	184	78	27	91	125	505	46	0	0	0	52	99	604
Ninh Binh	73	65	41	926	173	1279	39	10	10	0	23	82	1360
Ha Nam	78	18	1	159	205	461	729	365	0	0	49	1143	1604
Ha Tay	106	21	22	115	72	336	65	0	0	0	61	127	463
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	0	0	0	0	0	0	0	0	0	0	0	0	0
Thai Nguyen	68	0	1	50	27	147	68	0	0	0	27	95	242
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	148	55	37	45	35	320	64	0	0	0	129	193	513
Bac Giang	62	0	35	310	87	494	55	0	23	0	74	152	646
Phu Tho	193	44	1	211	166	615	4027	0	0	0	32	4059	4674
Vinh Phuc	27	0	1	53	28	109	27	0	0	0	28	55	164
Lao Cai	13	0	1	29	16	59	13	0	0	0	16	29	87
Yen Bai	15	0	1	33	17	66	15	0	0	0	17	32	98
Tuyen Quang	14	0	1	33	17	65	27	0	0	0	17	45	110
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	24	0	1	43	23	92	24	0	0	0	23	47	139
Lai Chau	25	0	1	29	16	71	25	0	0	0	16	41	111
Hoa Binh	85	0	1	37	22	144	64	0	0	0	26	90	235
Total	5514	1864	185	5113	2222	14898	6686	1707	33	0	1183	9609	24507

(b) The Year 2010

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	6574	1769	0	698	733	9775	0	0	0	0	6	6	9781
Hai Phong	0	0	0	0	0	0	0	0	0	0	0	0	0
Hai Duong	517	247	5	3336	701	4804	2243	2306	0	0	440	4989	9793
Hung Yen	223	60	19	40	63	404	102	0	0	0	229	332	735
Thai Binh	300	288	4	843	98	1533	129	0	0	0	65	194	1727
Nam Dinh	332	128	28	70	217	775	67	0	0	0	77	144	919
Ninh Binh	153	131	63	1463	321	2131	70	19	13	0	32	135	2266
Ha Nam	171	34	1	174	340	720	1349	607	0	0	92	2048	2768
Ha Tay	190	37	38	88	108	462	104	0	0	0	88	192	653
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	0	0	0	0	0	0	0	0	0	0	0	0	0
Thai Nguyen	78	0	1	38	38	156	78	0	0	0	38	116	272
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	436	142	149	35	56	817	144	0	0	0	236	381	1197
Bac Giang	146	0	55	341	149	691	105	0	44	0	123	272	963
Phu Tho	407	90	2	227	271	997	7536	0	0	0	47	7582	8579
Vinh Phuc	33	0	2	40	40	116	33	0	0	0	40	74	189
Lao Cai	15	0	2	22	22	62	15	0	0	0	22	37	99
Yen Bai	20	0	2	25	25	73	20	0	0	0	25	45	118
Tuyen Quang	29	0	2	25	25	81	57	0	0	0	25	82	163
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	354	571	5	33	83	1046	34	0	0	0	33	67	1113
Lai Chau	33	0	1	22	22	80	33	0	0	0	22	56	135
Hoa Binh	118	0	4	28	32	182	82	286	0	0	41	410	592
Total	10129	3497	384	7548	3347	24904	12202	3218	57	0	1684	17161	42065

(c) The Year 2020

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	11030	3408	0	861	924	16223	0	0	0	0	9	9	16231
Hai Phong	0	0	0	0	0	0	0	0	0	0	0	0	0
Hai Duong	830	353	6	4226	1017	6431	3667	4341	0	0	473	8481	14912
Hung Yen	455	112	23	31	93	714	182	0	0	0	339	522	1236
Thai Binh	634	557	5	1492	145	2832	237	0	0	0	97	334	3166
Nam Dinh	710	237	34	55	322	1358	118	0	0	0	114	233	1590
Ninh Binh	323	245	85	1820	476	2949	129	28	17	0	48	222	3170
Ha Nam	339	44	1	1237	802	2424	2249	1438	0	0	136	3824	6247
Ha Tay	382	72	50	70	161	734	184	0	0	0	130	314	1049
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	0	0	0	0	0	0	0	0	0	0	0	0	0
Thai Nguyen	76	0	1	31	57	165	76	0	0	0	57	133	299
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	570	293	269	28	83	1243	185	0	0	0	350	535	1777
Bac Giang	150	0	69	387	220	826	125	0	67	0	182	374	1200
Phu Tho	427	158	4	253	385	1226	12715	0	0	0	69	12783	14010
Vinh Phuc	33	0	2	32	60	127	33	0	0	0	60	92	219
Lao Cai	14	0	3	18	33	69	14	0	0	0	33	47	116
Yen Bai	21	0	3	20	37	81	21	0	0	0	37	58	139
Tuyen Quang	353	571	4	20	87	1035	97	0	0	0	37	134	1169
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	357	571	10	26	99	1063	37	0	0	0	49	86	1150
Lai Chau	33	0	2	18	33	86	33	0	0	0	33	66	153
Hoa Binh	127	0	7	22	48	204	82	286	0	0	61	429	633
Total	16862	6621	579	10648	5080	39789	20186	6093	83	0	2314	28676	68466

Table A18.2.17 Cargo Throughput by Province
Assumption 7: Excluding unloading of coal in Thai Binh(Coal Power Plant)

(a) The Year 2001

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	3772	1177	0	500	543	5993	0	0	0	0	3	3	5996
Hai Phong	674	341	1	481	483	1980	288	785	125	0	1266	2463	4443
Hai Duong	369	227	4	2312	547	3458	1264	1332	0	0	417	3014	6472
Hung Yen	109	30	9	52	39	239	58	0	0	0	126	184	423
Thai Binh	149	148	2	86	62	447	75	0	0	0	46	120	567
Nam Dinh	184	78	27	91	125	505	46	0	0	0	52	99	604
Ninh Binh	73	65	41	926	173	1279	39	10	10	0	23	82	1360
Ha Nam	78	18	1	159	205	461	729	365	0	0	49	1143	1604
Ha Tay	106	21	22	115	72	336	65	0	0	0	61	127	463
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	872	288	15	522	35	1732	86	0	44	6115	291	6537	8268
Thai Nguyen	68	0	1	50	27	147	68	0	0	0	27	95	242
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	148	55	37	45	35	320	64	0	0	0	129	193	513
Bac Giang	62	0	35	310	87	494	55	0	23	0	74	152	646
Phu Tho	193	44	1	211	166	615	4027	0	0	0	32	4059	4674
Vinh Phuc	27	0	1	53	28	109	27	0	0	0	28	55	164
Lao Cai	13	0	1	29	16	59	13	0	0	0	16	29	87
Yen Bai	15	0	1	33	17	66	15	0	0	0	17	32	98
Tuyen Quang	14	0	1	33	17	65	27	0	0	0	17	45	110
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	24	0	1	43	23	92	24	0	0	0	23	47	139
Lai Chau	25	0	1	29	16	71	25	0	0	0	16	41	111
Hoa Binh	85	0	1	37	22	144	64	0	0	0	26	90	235
Total	7060	2493	202	6115	2740	18610	7060	2493	202	6115	2740	18610	37219

(b) The Year 2010

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	6574	1749	0	698	733	9775	0	0	0	0	6	6	9781
Hai Phong	1177	488	1	2094	806	4566	487	1196	279	0	1976	3939	8505
Hai Duong	517	247	5	3336	701	4804	2243	2306	0	0	440	4989	9793
Hung Yen	223	60	19	40	63	404	102	0	0	0	229	332	735
Thai Binh	300	288	4	65	98	755	129	0	0	0	65	194	950
Nam Dinh	332	128	28	70	217	775	67	0	0	0	77	144	919
Ninh Binh	153	131	63	1463	321	2131	70	19	13	0	32	135	2266
Ha Nam	171	34	1	174	340	720	1349	607	0	0	92	2048	2768
Ha Tay	190	37	38	88	108	462	104	0	0	0	88	192	653
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1496	430	31	855	54	2866	113	0	80	10497	546	11236	14103
Thai Nguyen	78	0	1	38	38	156	78	0	0	0	38	116	272
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	436	142	149	35	56	817	144	0	0	0	236	381	1197
Bac Giang	146	0	55	341	149	691	105	0	44	0	123	272	963
Phu Tho	407	90	2	227	271	997	7536	0	0	0	47	7582	8579
Vinh Phuc	33	0	2	40	40	116	33	0	0	0	40	74	189
Lao Cai	15	0	2	22	22	62	15	0	0	0	22	37	99
Yen Bai	20	0	2	25	25	73	20	0	0	0	25	45	118
Tuyen Quang	29	0	2	25	25	81	57	0	0	0	25	82	163
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	354	571	5	33	83	1046	34	0	0	0	33	67	1113
Lai Chau	33	0	1	22	22	80	33	0	0	0	22	56	135
Hoa Binh	118	0	4	28	32	182	82	286	0	0	41	410	592
Total	12803	4414	416	9719	4207	31559	12803	4414	416	10497	4207	32336	63895

(c) The Year 2020

(Unit: 1,000 tons/year)

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	11030	3408	0	861	924	16223	0	0	0	0	9	9	16231
Hai Phong	2247	590	1	3409	1193	7440	683	1956	433	0	3229	6301	13741
Hai Duong	830	353	6	4226	1017	6431	3667	4341	0	0	473	8481	14912
Hung Yen	455	112	23	31	93	714	182	0	0	0	339	522	1236
Thai Binh	634	557	5	52	145	1392	237	0	0	0	97	334	1726
Nam Dinh	710	237	34	55	322	1358	118	0	0	0	114	233	1590
Ninh Binh	323	245	85	1820	476	2949	129	28	17	0	48	222	3170
Ha Nam	339	44	1	1237	802	2424	2249	1438	0	0	136	3824	6247
Ha Tay	382	72	50	70	161	734	184	0	0	0	130	314	1049
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1875	838	47	1193	80	4033	115	0	112	15250	809	16286	20319
Thai Nguyen	76	0	1	31	57	165	76	0	0	0	57	133	299
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	570	293	269	28	83	1243	185	0	0	0	350	535	1777
Bac Giang	150	0	69	387	220	826	125	0	67	0	182	374	1200
Phu Tho	427	158	4	253	385	1226	12715	0	0	0	69	12783	14010
Vinh Phuc	33	0	2	32	60	127	33	0	0	0	60	92	219
Lao Cai	14	0	3	18	33	69	14	0	0	0	33	47	116
Yen Bai	21	0	3	20	37	81	21	0	0	0	37	58	139
Tuyen Quang	353	571	4	20	87	1035	97	0	0	0	37	134	1169
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	357	571	10	26	99	1063	37	0	0	0	49	86	1150
Lai Chau	33	0	2	18	33	86	33	0	0	0	33	66	153
Hoa Binh	127	0	7	22	48	204	82	286	0	0	61	429	633
Total	20984	8049	628	13810	6352	49823	20984	8049	628	15250	6352	51263	101086

Table A18.2.18 Cargo Throughput by Province

Assumption 8: Excluding loading/unloading cargoes related to dam construction in Song La and Tuyen Quang

(a) The Year 2001

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	3772	1177	0	500	543	5993	0	0	0	0	3	3	5996
Hai Phong	674	341	1	481	483	1980	288	785	125	0	1266	2463	4443
Hai Duong	369	227	4	2312	547	3458	1264	1332	0	0	417	3014	6472
Hung Yen	109	30	9	52	39	239	58	0	0	0	126	184	423
Thai Binh	149	148	2	86	62	447	75	0	0	0	46	120	567
Nam Dinh	184	78	27	91	125	505	46	0	0	0	52	99	604
Ninh Binh	73	65	41	926	173	1279	39	10	10	0	23	82	1360
Ha Nam	78	18	1	159	205	461	729	365	0	0	49	1143	1604
Ha Tay	106	21	22	115	72	336	65	0	0	0	61	127	463
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	872	288	15	522	35	1732	86	0	44	6115	291	6537	8268
Thai Nguyen	68	0	1	50	27	147	68	0	0	0	27	95	242
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	148	55	37	45	35	320	64	0	0	0	129	193	513
Bac Giang	62	0	35	310	87	494	55	0	23	0	74	152	646
Phu Tho	193	44	1	211	166	615	4027	0	0	0	32	4059	4674
Vinh Phuc	27	0	1	53	28	109	27	0	0	0	28	55	164
Lao Cai	13	0	1	29	14	59	13	0	0	0	14	29	87
Yen Bai	15	0	1	33	17	66	15	0	0	0	17	32	98
Tuyen Quang	14	0	1	33	17	65	27	0	0	0	17	45	110
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	24	0	1	43	23	92	24	0	0	0	23	47	139
Lai Chau	25	0	1	29	16	71	25	0	0	0	16	41	111
Hoa Binh	85	0	1	37	22	144	64	0	0	0	26	90	235
Total	7060	2493	202	6115	2740	18610	7060	2493	202	6115	2740	18610	37219

(b) The Year 2010

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	6574	1769	0	698	733	9775	0	0	0	0	6	6	9781
Hai Phong	1177	488	1	2094	806	4566	487	1196	279	0	1976	3939	8505
Hai Duong	517	247	5	3336	701	4804	2243	2306	0	0	440	4989	9793
Hung Yen	223	60	19	40	63	404	102	0	0	0	229	332	735
Thai Binh	300	288	4	843	98	1533	129	0	0	0	65	194	1727
Nam Dinh	332	128	28	70	217	775	67	0	0	0	77	144	919
Ninh Binh	153	131	63	1463	321	2131	70	19	13	0	32	135	2266
Ha Nam	171	34	1	174	340	720	1349	607	0	0	92	2048	2768
Ha Tay	190	37	38	88	108	462	104	0	0	0	88	192	653
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1496	430	31	855	54	2866	113	0	80	10497	546	11236	14103
Thai Nguyen	78	0	1	38	38	156	78	0	0	0	38	116	272
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	436	142	149	35	56	817	144	0	0	0	236	381	1197
Bac Giang	146	0	55	341	149	691	105	0	44	0	123	272	963
Phu Tho	407	90	2	227	271	997	7536	0	0	0	47	7582	8579
Vinh Phuc	33	0	2	40	40	116	33	0	0	0	40	74	189
Lao Cai	15	0	2	22	22	62	15	0	0	0	22	37	99
Yen Bai	20	0	2	25	25	73	20	0	0	0	25	45	118
Tuyen Quang	29	0	2	25	25	81	57	0	0	0	25	82	163
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	34	0	5	33	33	105	34	0	0	0	33	67	172
Lai Chau	33	0	1	22	22	80	33	0	0	0	22	56	135
Hoa Binh	118	0	4	28	32	182	82	286	0	0	41	410	592
Total	12483	3843	416	10497	4157	31395	12803	4414	416	10497	4207	32336	63732

(c) The Year 2020

	Unloading						Loading						Total
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal	Others	Total	
Hanoi	11030	3408	0	861	924	16223	0	0	0	0	9	9	16231
Hai Phong	2247	590	1	3409	1193	7440	683	1956	433	0	3229	6301	13741
Hai Duong	830	353	6	4226	1017	6431	3667	4341	0	0	473	8481	14912
Hung Yen	455	112	23	31	93	714	182	0	0	0	339	522	1236
Thai Binh	634	557	5	1492	145	2832	237	0	0	0	97	334	3166
Nam Dinh	710	237	34	55	322	1358	118	0	0	0	114	233	1590
Ninh Binh	323	245	85	1820	474	2949	129	28	17	0	48	222	3170
Ha Nam	339	44	1	1237	802	2424	2249	1438	0	0	136	3824	6247
Ha Tay	382	72	50	70	161	734	184	0	0	0	130	314	1049
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1875	838	47	1193	80	4033	115	0	112	15250	809	16286	20319
Thai Nguyen	76	0	1	31	57	165	76	0	0	0	57	133	299
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	570	293	269	28	83	1243	185	0	0	0	350	535	1777
Bac Giang	150	0	69	387	220	826	125	0	67	0	182	374	1200
Phu Tho	427	158	4	253	385	1226	12715	0	0	0	69	12783	14010
Vinh Phuc	33	0	2	32	60	127	33	0	0	0	60	92	219
Lao Cai	14	0	3	18	33	69	14	0	0	0	33	47	116
Yen Bai	21	0	3	20	37	81	21	0	0	0	37	58	139
Tuyen Quang	33	0	4	20	37	94	97	0	0	0	37	134	228
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	37	0	10	26	49	122	37	0	0	0	49	86	209
Lai Chau	33	0	2	18	33	86	33	0	0	0	33	66	153
Hoa Binh	127	0	7	22	48	204	82	286	0	0	61	429	633
Total	20344	6907	628	15250	6252	49381	20984	8049	628	15250	6352	51263	100644

Table A18.2.19 Cargo Throughput by Province

Assumption 9: Excluding intra movement of all cargoes

(a) The Year 2001

(Unit: 1,000 tons/year)

	Unloading					Loading					Total		
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal		Others	Total
Hanoi	3772	1177	0	500	543	5993	0	0	0	0	3	3	5996
Hai Phong	674	341	1	481	483	1980	288	785	125	0	1266	2463	4443
Hai Duong	221	0	4	2312	505	3041	1264	1332	0	0	375	2971	6012
Hung Yen	51	30	9	52	12	154	58	0	0	0	99	157	311
Thai Binh	74	148	2	86	17	327	75	0	0	0	0	75	402
Nam Dinh	137	78	27	91	77	410	46	0	0	0	4	50	460
Ninh Binh	34	55	31	926	151	1197	39	10	10	0	0	59	1256
Ha Nam	55	0	1	159	202	417	729	365	0	0	46	1140	1557
Ha Tay	41	21	22	115	11	210	65	0	0	0	0	65	275
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	872	288	15	522	35	1732	86	0	44	6115	291	6537	8268
Thai Nguyen	0	0	1	50	0	51	68	0	0	0	0	68	120
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	121	55	37	45	11	269	64	0	0	0	105	169	438
Bac Giang	22	0	33	310	49	414	55	0	23	0	36	114	528
Phu Tho	99	44	1	211	134	489	4027	0	0	0	0	4027	4516
Vinh Phuc	0	0	1	53	0	54	27	0	0	0	0	27	81
Lao Cai	0	0	1	29	0	30	13	0	0	0	0	13	43
Yen Bai	0	0	1	33	0	34	15	0	0	0	0	15	48
Tuyen Quang	0	0	1	33	0	34	27	0	0	0	0	27	61
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	0	0	1	43	0	45	24	0	0	0	0	24	69
Lai Chau	0	0	1	29	0	30	25	0	0	0	0	25	55
Hoa Binh	21	0	1	37	2	61	64	0	0	0	7	71	132
Total	6194	2238	190	6115	2231	16969	7060	2493	202	6115	2231	18101	35069

(b) The Year 2010

(Unit: 1,000 tons/year)

	Unloading					Loading					Total		
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal		Others	Total
Hanoi	6574	1769	0	698	733	9775	0	0	0	0	6	6	9781
Hai Phong	1177	488	1	2094	806	4566	487	1196	279	0	1976	3939	8505
Hai Duong	365	0	5	3336	640	4345	2243	2306	0	0	379	4928	9273
Hung Yen	121	60	19	40	23	262	102	0	0	0	190	292	554
Thai Binh	171	288	4	843	33	1339	129	0	0	0	0	129	1468
Nam Dinh	265	128	28	70	148	638	67	0	0	0	8	75	713
Ninh Binh	83	112	51	1463	289	1997	70	19	13	0	0	102	2099
Ha Nam	130	0	1	174	335	641	1349	607	0	0	87	2043	2684
Ha Tay	86	37	38	88	20	270	104	0	0	0	0	104	374
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1496	430	31	855	54	2866	113	0	80	10497	546	11236	14103
Thai Nguyen	0	0	1	38	0	39	78	0	0	0	0	78	117
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	373	142	149	35	21	720	144	0	0	0	202	346	1066
Bac Giang	62	0	53	341	94	549	105	0	44	0	68	217	767
Phu Tho	237	90	2	227	225	780	7536	0	0	0	0	7536	8316
Vinh Phuc	0	0	2	40	0	42	33	0	0	0	0	33	75
Lao Cai	0	0	2	22	0	25	15	0	0	0	0	15	39
Yen Bai	0	0	2	25	0	27	20	0	0	0	0	20	47
Tuyen Quang	0	0	2	25	0	28	57	0	0	0	0	57	84
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	320	571	5	33	50	980	34	0	0	0	0	34	1013
Lai Chau	0	0	1	22	0	24	33	0	0	0	0	33	57
Hoa Binh	36	0	4	28	4	72	82	286	0	0	13	382	453
Total	11496	4115	401	10497	3475	29984	12803	4414	416	10497	3475	31605	61589

(c) The Year 2020

(Unit: 1,000 tons/year)

	Unloading					Loading					Total		
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal		Others	Total
Hanoi	11030	3408	0	861	924	16223	0	0	0	0	9	9	16231
Hai Phong	2247	590	1	3409	1193	7440	683	1956	433	0	3229	6301	13741
Hai Duong	557	0	6	4226	927	5715	3667	4341	0	0	382	8391	14106
Hung Yen	272	112	23	31	34	473	182	0	0	0	281	463	937
Thai Binh	396	557	5	1492	48	2498	237	0	0	0	0	237	2735
Nam Dinh	591	237	34	55	219	1136	118	0	0	0	11	130	1266
Ninh Binh	193	217	68	1820	428	2727	129	28	17	0	0	174	2901
Ha Nam	272	0	1	1237	795	2306	2249	1438	0	0	130	3817	6122
Ha Tay	198	72	50	70	30	420	184	0	0	0	0	184	604
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	1875	838	47	1193	80	4033	115	0	112	15250	809	16286	20319
Thai Nguyen	0	0	1	31	0	32	76	0	0	0	0	76	108
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	505	293	269	28	31	1126	185	0	0	0	298	483	1609
Bac Giang	72	0	67	387	139	664	125	0	67	0	101	293	957
Phu Tho	272	158	4	253	316	1003	12715	0	0	0	0	12715	13717
Vinh Phuc	0	0	2	32	0	34	33	0	0	0	0	33	67
Lao Cai	0	0	3	18	0	21	14	0	0	0	0	14	35
Yen Bai	0	0	3	20	0	23	21	0	0	0	0	21	44
Tuyen Quang	320	571	4	20	50	965	97	0	0	0	0	97	1062
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	320	571	10	26	50	977	37	0	0	0	0	37	1014
Lai Chau	0	0	2	18	0	20	33	0	0	0	0	33	53
Hoa Binh	45	0	7	22	4	81	82	286	0	0	20	388	468
Total	19165	7624	609	15250	5270	47918	20984	8049	628	15250	5270	50180	98098

Table A18.2.20 Cargo Throughput by Province in the Northern Region, 2001

Assumption 10: Excluding all assumptions 1- 9

(a) The Year 2001

(Unit: 1,000 tons/year)

	Unloading					Loading					Total		
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal		Others	Total
Hanoi	3772	1177	0	500	543	5993	0	0	0	0	3	3	5996
Hai Phong	0	0	0	0	0	0	0	0	0	0	0	0	0
Hai Duong	221	0	4	80	110	414	0	0	0	0	4	4	418
Hung Yen	51	30	9	52	12	154	0	0	0	0	99	99	253
Thai Binh	74	148	2	86	17	327	0	0	0	0	0	0	327
Nam Dinh	137	78	27	91	77	410	0	0	0	0	4	4	414
Ninh Binh	34	55	31	926	151	1197	0	10	10	0	0	20	1217
Ha Nam	55	0	1	38	0	94	0	0	0	0	46	46	139
Ha Tay	41	21	22	115	11	210	0	0	0	0	0	0	210
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	0	0	0	0	0	0	0	0	0	0	0	0	0
Thai Nguyen	0	0	1	50	0	51	0	0	0	0	0	0	51
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	121	55	37	45	11	269	0	0	0	0	105	105	374
Bac Giang	22	0	33	310	49	414	0	0	23	0	36	59	472
Phu Tho	99	44	1	211	134	489	0	0	0	0	0	0	489
Vinh Phuc	0	0	1	53	0	54	0	0	0	0	0	0	54
Lao Cai	0	0	1	29	0	30	0	0	0	0	0	0	30
Yen Bai	0	0	1	33	0	34	0	0	0	0	0	0	34
Tuyen Quang	0	0	1	33	0	34	0	0	0	0	0	0	34
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	0	0	1	43	0	45	0	0	0	0	0	0	45
Lai Chau	0	0	1	29	0	30	0	0	0	0	0	0	30
Hoa Binh	21	0	1	37	2	61	0	0	0	0	7	7	68
Total	4648	1609	174	2760	1117	10307	0	10	33	0	303	346	10653

(b) The Year 2010

(Unit: 1,000 tons/year)

	Unloading					Loading					Total		
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal		Others	Total
Hanoi	6574	1769	0	698	733	9775	0	0	0	0	6	6	9781
Hai Phong	0	0	0	0	0	0	0	0	0	0	0	0	0
Hai Duong	365	0	5	61	211	642	0	0	0	0	8	8	649
Hung Yen	121	60	19	40	23	262	0	0	0	0	190	190	452
Thai Binh	171	288	4	65	33	561	0	0	0	0	0	0	561
Nam Dinh	265	128	28	70	148	638	0	0	0	0	8	8	646
Ninh Binh	83	112	51	1463	289	1997	0	19	13	0	0	32	2028
Ha Nam	130	0	1	29	0	160	0	0	0	0	87	87	248
Ha Tay	86	37	38	88	20	270	0	0	0	0	0	0	270
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	0	0	0	0	0	0	0	0	0	0	0	0	0
Thai Nguyen	0	0	1	38	0	39	0	0	0	0	0	0	39
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	373	142	149	35	21	720	0	0	0	0	202	202	922
Bac Giang	62	0	53	341	94	549	0	0	44	0	68	112	661
Phu Tho	237	90	2	227	225	780	0	0	0	0	0	0	780
Vinh Phuc	0	0	2	40	0	42	0	0	0	0	0	0	42
Lao Cai	0	0	2	22	0	25	0	0	0	0	0	0	25
Yen Bai	0	0	2	25	0	27	0	0	0	0	0	0	27
Tuyen Quang	0	0	2	25	0	28	0	0	0	0	0	0	28
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	0	0	5	33	0	39	0	0	0	0	0	0	39
Lai Chau	0	0	1	22	0	24	0	0	0	0	0	0	24
Hoa Binh	36	0	4	28	4	72	0	0	0	0	13	13	85
Total	8503	2626	369	3350	1801	16649	0	19	57	0	581	657	17306

(c) The Year 2020

(Unit: 1,000 tons/year)

	Unloading					Loading					Total		
	CM	Cement	Fertilizer	Coal	Others	Total	CM	Cement	Fertilizer	Coal		Others	Total
Hanoi	11030	3408	0	861	924	16223	0	0	0	0	9	9	16231
Hai Phong	0	0	0	0	0	0	0	0	0	0	0	0	0
Hai Duong	557	0	6	49	312	924	0	0	0	0	11	11	935
Hung Yen	272	112	23	31	34	473	0	0	0	0	281	281	754
Thai Binh	396	557	5	52	48	1058	0	0	0	0	0	0	1058
Nam Dinh	591	237	34	55	219	1126	0	0	0	0	11	11	1148
Ninh Binh	193	217	68	1820	428	2727	0	28	17	0	0	44	2771
Ha Nam	272	0	1	23	0	296	0	0	0	0	130	130	426
Ha Tay	198	72	50	70	30	420	0	0	0	0	0	0	420
Cao Bang	0	0	0	0	0	0	0	0	0	0	0	0	0
Lang Son	0	0	0	0	0	0	0	0	0	0	0	0	0
Quang Ninh	0	0	0	0	0	0	0	0	0	0	0	0	0
Thai Nguyen	0	0	1	31	0	32	0	0	0	0	0	0	32
Bac Can	0	0	0	0	0	0	0	0	0	0	0	0	0
Bac Ninh	505	293	269	28	31	1126	0	0	0	0	298	298	1424
Bac Giang	72	0	67	387	139	664	0	0	67	0	101	167	832
Phu Tho	272	158	4	253	316	1003	0	0	0	0	0	0	1003
Vinh Phuc	0	0	2	32	0	34	0	0	0	0	0	0	34
Lao Cai	0	0	3	18	0	21	0	0	0	0	0	0	21
Yen Bai	0	0	3	20	0	23	0	0	0	0	0	0	23
Tuyen Quang	0	0	4	20	0	24	0	0	0	0	0	0	24
Ha Giang	0	0	0	0	0	0	0	0	0	0	0	0	0
Son La	0	0	10	26	0	36	0	0	0	0	0	0	36
Lai Chau	0	0	2	18	0	20	0	0	0	0	0	0	20
Hoa Binh	45	0	7	22	4	81	0	0	0	0	20	20	101
Total	14404	5054	560	3817	2487	26321	0	28	83	0	861	972	27293

Appendix 19 Japanese Standard on Dimensions of Waterways & Berths

In Japan, the following standards are applied in general, according to the Technical Standards and Commentaries of Port and Harbour Facilities in Japan (1999 edition) published by the Japan Port and Harbour Association, stipulated by the Ordinance of the Minister of Transport, which was issued in April 1999.

Table A19.1.1 Japanese Standard on Dimensions of Waterways & Berths

Standard Size of Cargo Vessel				Least Dimensions of Waterways						Dimensions of Berths	
DWT	Length (m)	Breadth (m)	draft (m)	Depth (m)	Width 1 (m)	Width 2 (m)	Width 3 (m)	Width 4 (m)	Radius (m)	Length (m)	Crest Level (HWL+ m)
500	51	9.0	3.3	4.0	26	51	77	102	204	60	0.3 - 1.0
700	57	9.5	3.4	4.0	29	57	86	114	228	70	0.3 - 1.0
1,000	67	10.9	3.9	4.5	34	67	101	134	268	80	0.5 - 1.5
2,000	83	13.1	4.9	5.5	42	83	125	166	332	100	0.5 - 1.5
3,000	94	14.6	5.6	6.5	47	94	141	188	376	110	0.5 - 1.5
5,000	109	16.8	6.5	7.5	55	109	164	218	436	130	0.5 - 1.5

Note) Width 1: For a one-way channel

Width 2: For a double-way channel

Width 3: For a double-way channel (long or with heavy traffic)

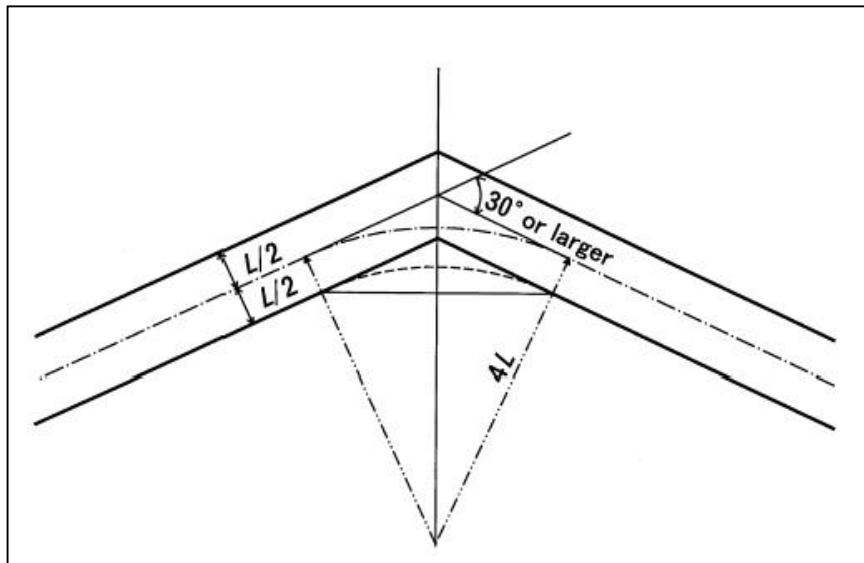
Width 4: For a double-way channel (long and with heavy traffic)

Source) Technical Standards and Commentaries of Port and Harbour Facilities in Japan (1999 edition) published by the Japan Port and Harbour Association, stipulated by the Ordinance of the Minister of Transport, which was issued in April 1999.

(1) Alignment of navigation channel

- + When a navigation channel has a bend, the intersection angle of centerlines of channels at the bend shall be made as small as possible.
- + In the determination of the intersection angle at a bend of navigation channel, it is necessary to consider the turning diameters, the sailing speeds, the ratio of vessel's draft to water depth, the number of navigation aids deployed, etc.
- + It is advisable that the intersection angle of channel centerlines at a bend will not exceed approximately 30°. When the angle exceeds 30°, the centerline of the channel at the bend should be made as an arc having the radius of curvature larger than about four times the length overall of the target vessel. The width of the channel at such a bend should be equal to or larger than the required width, except for cases where the target vessel has good turning performance or where a sufficient number of signals or other facilities have been provided to allow safe and smooth ship maneuvering.
- + At a bend of a double-way channel where the intersection angle is 30° or

greater and the channel width is equal to L (the length overall of the target vessel), it is necessary to increase the channel width at the bend with a corner cut.



Source) Technical Standards and Commentaries of Port and Harbour Facilities in Japan (1999 edition) published by the Japan Port and Harbour Association, stipulated by the Ordinance of the Minister of Transport, which was issued in April 1999.

Figure A19.1.1 Width Increase with Corner Cut at Bend Section

(2) Width of navigation channel

- + In the determination of the width of a navigation channel, due consideration shall be given to the types and dimensions of target vessels, the traffic volume and length of the channel, and natural conditions.
- + The following values are adopted as the standard width ("L" indicates the length overall of the target vessel):
 - (a) For a double-way channel, an appropriate width that is $1.0L$ or larger is adopted, except for:
 - cases in which the length of the navigation channel is relatively long: $1.5L$
 - cases in which the target vessels frequently pass in both ways through the channel: $1.5L$
 - cases in which the target vessels frequently pass in both ways through the channel and the length of the channel is relatively long: $2.0L$
 - (b) For a one-way channel, an appropriate width that is $0.5L$ or larger is adopted. When the width becomes less than $1.0L$, it is desirable to introduce sufficient safety measures such as the provision of facilities to

assist navigation.

(3) Water depth of berth & navigation channel

- + The water depth of a berth and a navigation channel shall be set in principle by adding an appropriate keel clearance to the maximum draft. For the keel clearance, a value equal to about 10% of the maximum draft is used as a standard.

(4) Length of berth

- + The length of a berth shall be set in principle by adding the lengths of the bow and stern mooring ropes to the length overall of the target vessel. The bow and stern ropes are usually set at an angle of 30 to 45° with the quay face, because these ropes are used to prevent both the longitudinal movement (in the bow and stern directions) and lateral movement (in the onshore and offshore directions) of the vessel.