

## APPENDIX

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# APPENDIX-1

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## IWT CARGO VOLUMES

Table APX1-1 Cargo Volume on Inland Waterway Transport (1996)

ID	Products	Barge No.	Transport Distance	Volume		Ton Kms		Ave. Volume	Ave. Transport Distance	Ave. TonKms
		(nr)	(km)	(ton)	(%)	(ton km)	(%)	(ton)	(km)	(ton km)
1	Petroleum Products	2,209	625,530	589,893	18.35%	177,257,239	14.42%	267.0	283.2	80,243.2
2	Cement	8	6,335	2,450	0.08%	1,946,950	0.16%	306.3	791.9	243,368.8
3	Sand/Gravel	90	5,008	20,180	0.63%	1,247,500	0.10%	224.2	55.6	13,861.1
4	Phosphate	266	202,116	179,229	5.58%	137,915,556	11.22%	673.8	759.8	518,479.5
5	Coal	1,097	284,624	592,591	18.44%	153,861,536	12.52%	540.2	259.5	140,256.6
6	Stones	3,777	811,258	810,896	25.23%	167,053,010	13.59%	214.7	214.8	44,229.0
7	Clay	312	299,242	179,109	5.57%	170,336,361	13.86%	574.1	959.1	545,949.9
8	Sulphur	124	67,764	68,098	2.12%	37,167,796	3.02%	549.2	546.5	299,740.3
9	Other Minerals	46	16,474	16,619	0.52%	7,411,667	0.60%	361.3	358.1	161,123.2
10	Grains (Wheat)	-	-	-	-	-	-	-	-	-
11	Sugar	33	23,759	10,221	0.32%	7,401,037	0.60%	309.7	720.0	224,273.8
12	Molasses	1,375	771,826	471,246	14.66%	267,225,183	21.74%	342.7	561.3	194,345.6
13	Aluminium Material	9	7,587	5,031	0.16%	4,241,133	0.35%	559.0	843.0	471,237.0
14	Fertilizers	2	741	560	0.02%	200,700	0.02%	280.0	370.5	100,350.0
15	Pulp Paper	3	2,544	560	0.02%	478,870	0.04%	186.7	848.0	159,623.3
16	General Cargo	173	102,627	21,171	0.66%	11,839,121	0.96%	122.4	593.2	68,434.2
17	Iron & Steel	14	9,283	1,500	0.05%	936,800	0.08%	107.1	663.1	66,914.3
18	Coke	524	138,978	161,552	5.03%	43,782,112	3.56%	308.3	265.2	83,553.6
19	Aluminum Products	154	103,243	48,066	1.50%	32,054,284	2.61%	312.1	670.4	208,144.7
20	Ferro Silicon	-	-	-	-	-	-	-	-	-
21	Animal Grease	-	-	-	-	-	-	-	-	-
22	Food Products	101	18657	35,252	1.10%	6,919,076	0.56%	349.0	184.7	68,505.7
23	Clinker	-	-	-	-	-	-	-	-	-
	Total	10,317	3,497,596	3,214,224	100.00%	1,229,275,931	100.00%	311.5	339.0	119,150.5

Source: 2003 JICA Study Report

Table APX1-2 Cargo Volume on Inland Waterway Transport (2001)

ID	Products	Barge No.	Transport Distance	Volume		Ton Kms		Ave. Volume	Ave. Transport Distance	Ave. TonKms
		(nr)	(km)	(ton)	(%)	(ton km)	(%)	(ton)	(km)	(ton km)
1	Petroleum Products	993	419,303	292,347	14.01%	130,094,997	12.91%	294.4	422.3	131,012.1
2	Cement	-	-	-	-	-	-	-	-	-
3	Sand/Gravel	-	-	-	-	-	-	-	-	-
4	Phosphate	423	320,565	271,298	13.01%	204,705,351	20.32%	641.4	757.8	483,937.0
5	Coal	325	87,308	169,822	8.14%	45,735,920	4.54%	522.5	268.6	140,725.9
6	Stones	2,254	540,679	527,516	25.29%	116,818,719	11.59%	234.0	239.9	51,827.3
7	Clay	270	128,283	118,380	5.68%	45,922,410	4.56%	438.4	475.1	170,083.0
8	Sulphur	166	80,610	70,779	3.39%	33,168,353	3.29%	426.4	485.6	199,809.4
9	Other Minerals	21	7,790	11,260	0.54%	4,507,480	0.45%	536.2	371.0	214,641.9
10	Grains (Wheat)	-	-	-	-	-	-	-	-	-
11	Sugar	3	2,199	600	0.03%	439,800	0.04%	200.0	733.0	146,600.0
12	Molasses	1,220	885,788	412,415	19.77%	306,271,074	30.40%	338.0	726.1	251,041.9
13	Aluminium Material	126	106,218	54,341	2.61%	45,809,463	4.55%	431.3	843.0	363,567.2
14	Fertilizers	-	-	-	-	-	-	-	-	-
15	Pulp Paper	-	-	-	-	-	-	-	-	-
16	General Cargo	87	57,025	14,195	0.68%	9,154,545	0.91%	163.2	655.5	105,224.7
17	Iron & Steel	32	9,914	11,611	0.56%	3,158,541	0.31%	362.8	309.8	98,704.4
18	Coke	107	27,926	43,397	2.08%	11,383,700	1.13%	405.6	261.0	106,389.7
19	Aluminum Products	145	96,720	57,034	2.73%	38,560,407	3.83%	393.3	667.0	265,933.8
20	Ferro Silicon	12	12,840	5,924	0.28%	6,338,680	0.63%	493.7	1,070.0	528,223.3
21	Animal Grease	-	-	-	-	-	-	-	-	-
22	Food Products	85	18,746	25,046	1.20%	5,542,978	0.55%	294.7	220.5	65,211.5
23	Clinker	-	-	-	-	-	-	-	-	-
	Total	6,269	2,801,914	2,085,965	100.00%	1,007,612,418	100.00%	332.7	446.9	160,729.4

Source: 2003 JICA Study Report

Table APX1-3 Cargo Volume on Inland Waterway Transport (2007)

ID	Products	Barge No.	Transport Distance	Volume		Ton Kms		Ave. Volume	Ave. Transport Distance	Ave. TonKms
		(nr)	(km)	(ton)	(%)	(ton km)	(%)	(ton)	(km)	(ton km)
1	Petroleum Products	1,121	322,926	541,200	21.19%	162,745,683	18.92%	300.7	504.0	151,550.8
2	Cement	183	88,097	62,952	2.46%	30,305,367	3.52%	481.4	344.0	165,603.1
3	Sand/Gravel	-	-	-	-	-	-	-	-	-
4	Phosphate	544	297,310	379,972	14.88%	213,798,625	24.85%	562.7	719.1	404,621.3
5	Coal	50	23,395	53,500	2.09%	25,032,650	2.91%	467.9	1,070.0	500,653.0
6	Stones	1,540	542,269	318,701	12.48%	110,543,932	12.85%	346.9	203.9	70,708.5
7	Clay	1,132	270,297	127,749	5.00%	56,291,990	6.54%	440.6	208.3	91,768.7
8	Sulphur	447	109,208	894	0.04%	218,416	0.03%	244.3	2.0	488.6
9	Other Minerals	-	-	-	-	-	-	-	-	-
10	Grains (Wheat)	-	-	-	-	-	-	-	-	-
11	Sugar	-	-	-	-	-	-	-	-	-
12	Molasses	1,141	254,790	809,832	31.71%	182,410,972	21.20%	225.2	715.9	161,259.2
13	Aluminium Material	-	-	-	-	-	-	-	-	-
14	Fertilizers	10	7,028	3,440	0.13%	2,417,631	0.28%	702.8	344.0	241,763.0
15	Pulp Paper	-	-	-	-	-	-	-	-	-
16	General Cargo	194	31,536	82,199	3.22%	11,901,587	1.38%	144.8	377.4	54,643.3
17	Iron & Steel	26	13,186	7,218	0.28%	3,021,708	0.35%	418.6	229.2	95,934.5
18	Coke	164	53,888	43,450	1.70%	14,331,640	1.67%	329.8	266.0	87,722.3
19	Aluminum Products	125	43,331	66,741	2.61%	25,437,609	2.96%	381.1	587.1	223,749.0
20	Ferro Silicon	37	16,331	39,590	1.55%	17,474,170	2.03%	441.4	1,070.0	472,274.9
21	Animal Grease	-	-	-	-	-	-	-	-	-
22	Food Products	48	13,000	16,512	0.65%	4,472,000	0.52%	270.8	344.0	93,166.7
23	Clinker	-	-	-	-	-	-	-	-	-
	Total	6,762	2,086,592	2,553,950	100.00%	860,403,980	100.00%	336.9	412.3	138,916.8

Source: RTA

## APPENDIX-2

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IWT OD MATRIXES (2007)



























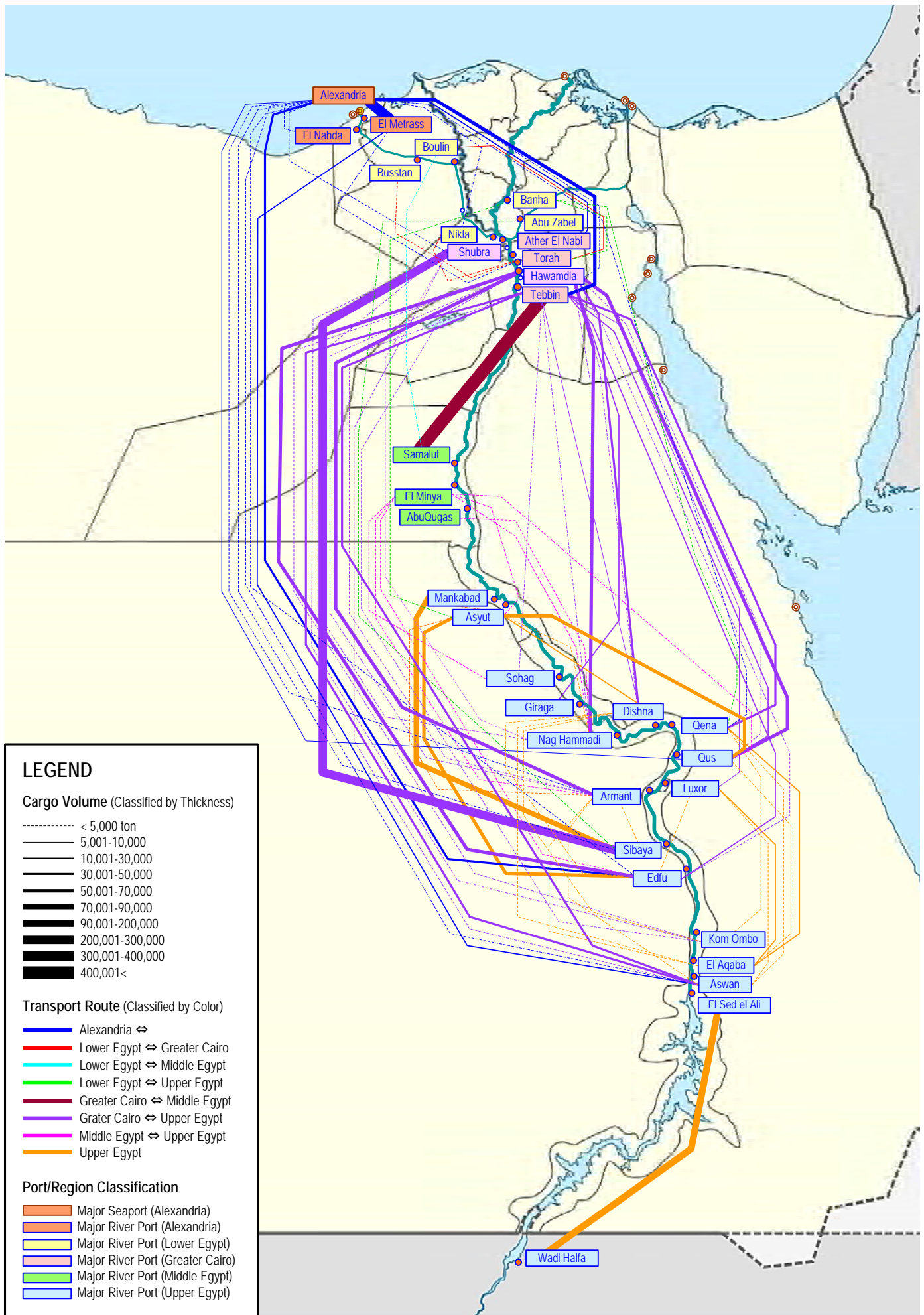




## APPENDIX-3

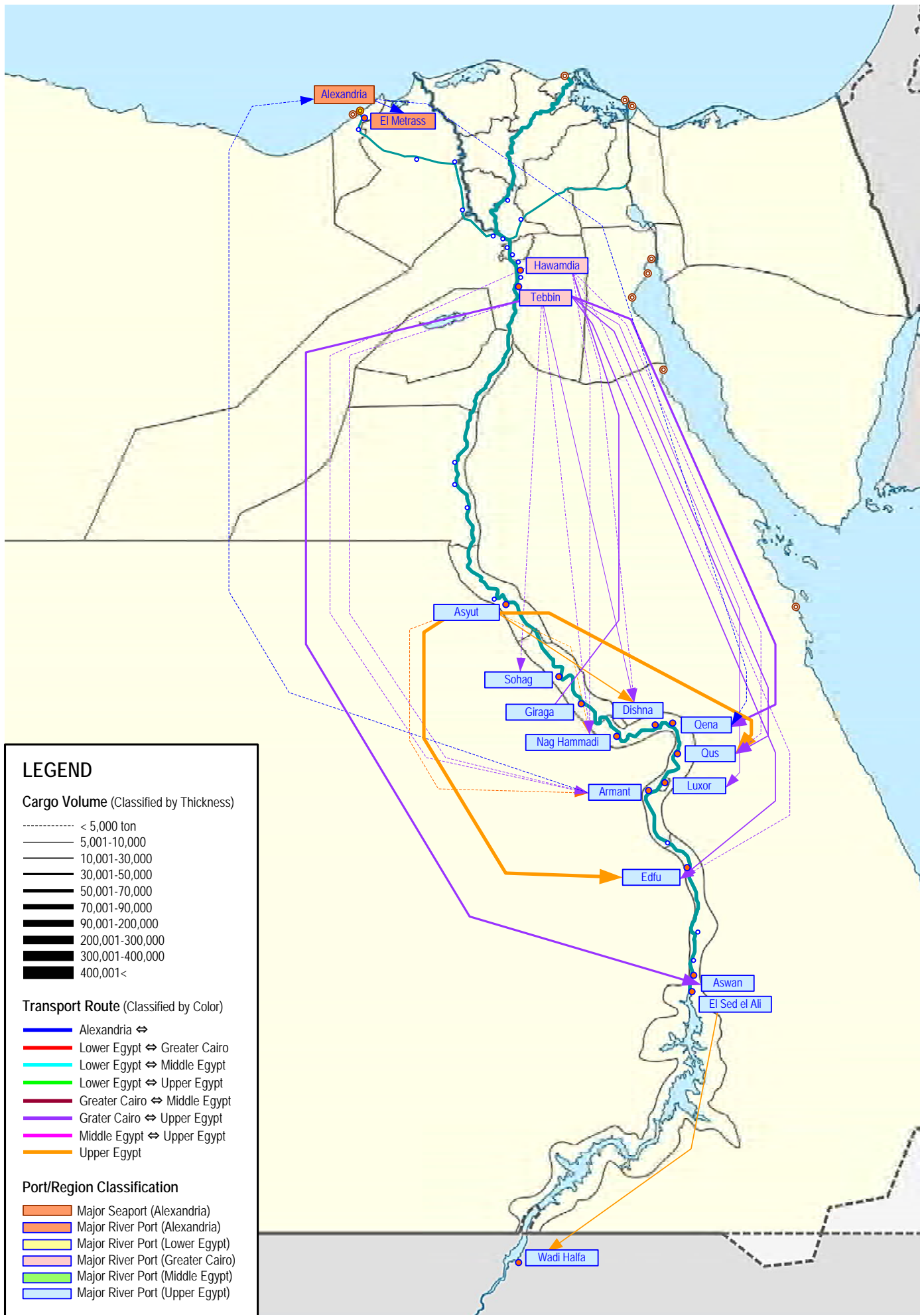
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### IWT OD DIAGRAMS (2007)



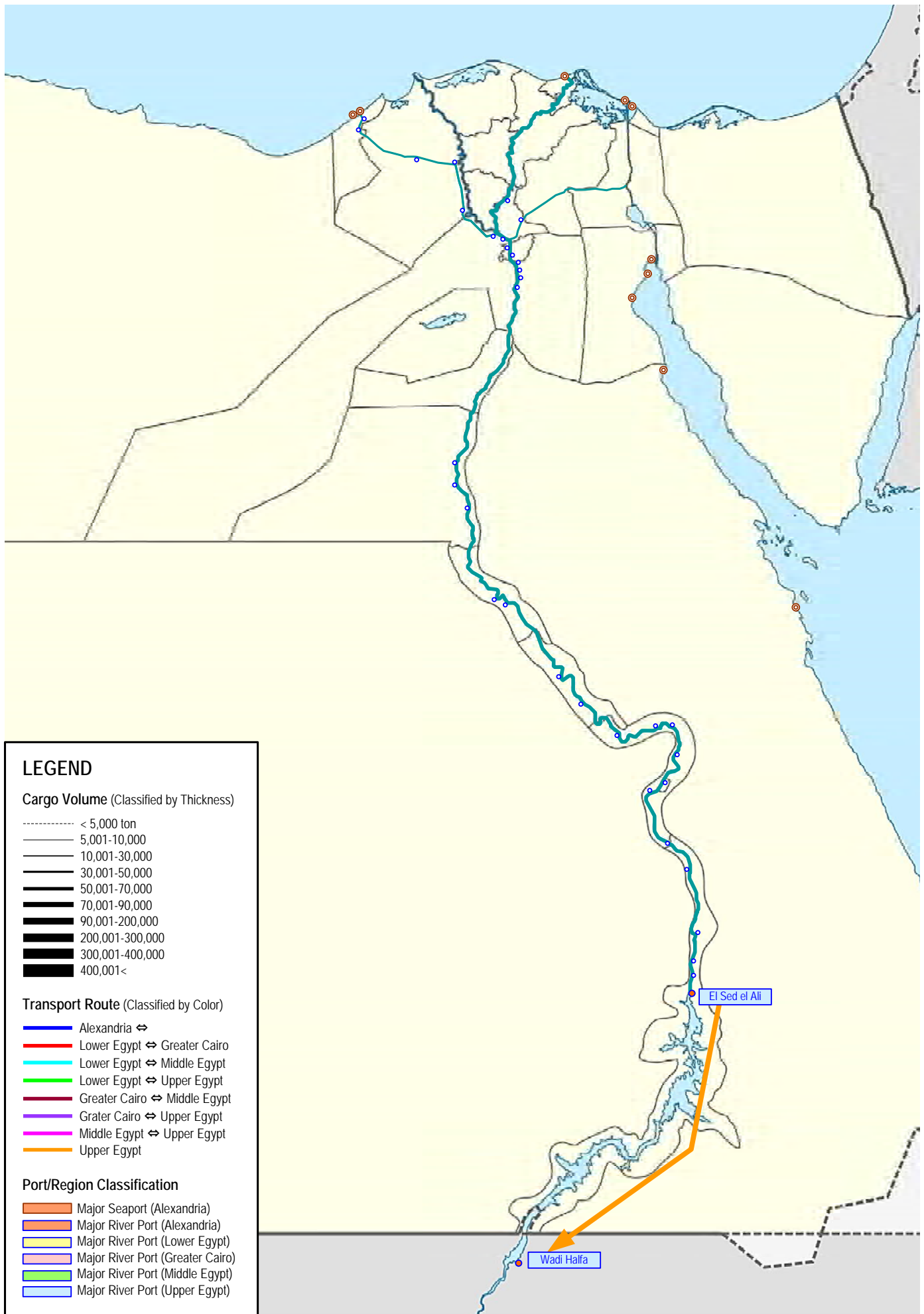
Source: RTA

Figure APX3-1 OD Diagram in 2007 (All Commodities)



Source: RTA

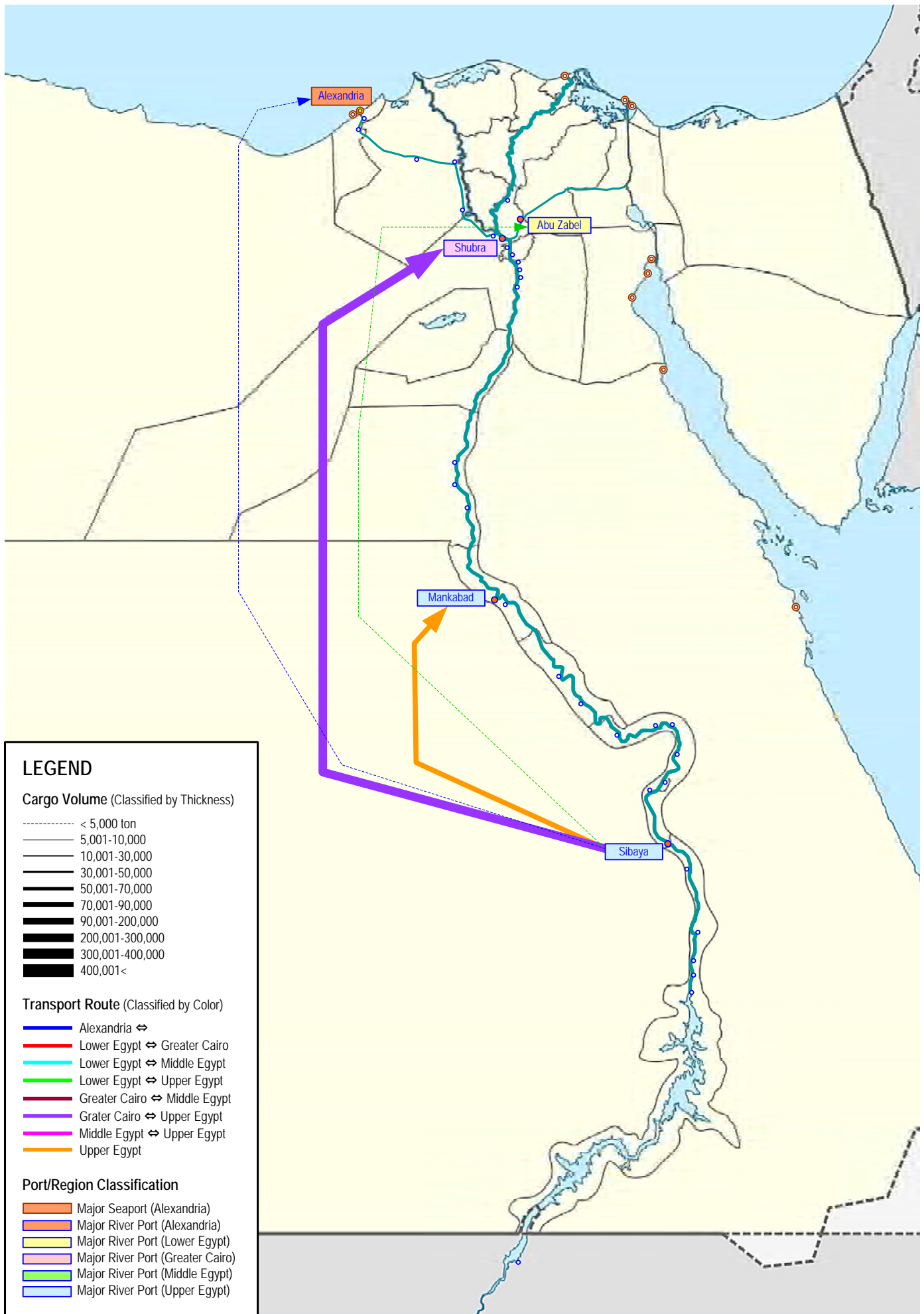
Figure APX3-2 OD Diagram in 2007 (Petroleum Products)



Source: RTA

Figure APX3-3 OD Diagram in 2007 (Cement)

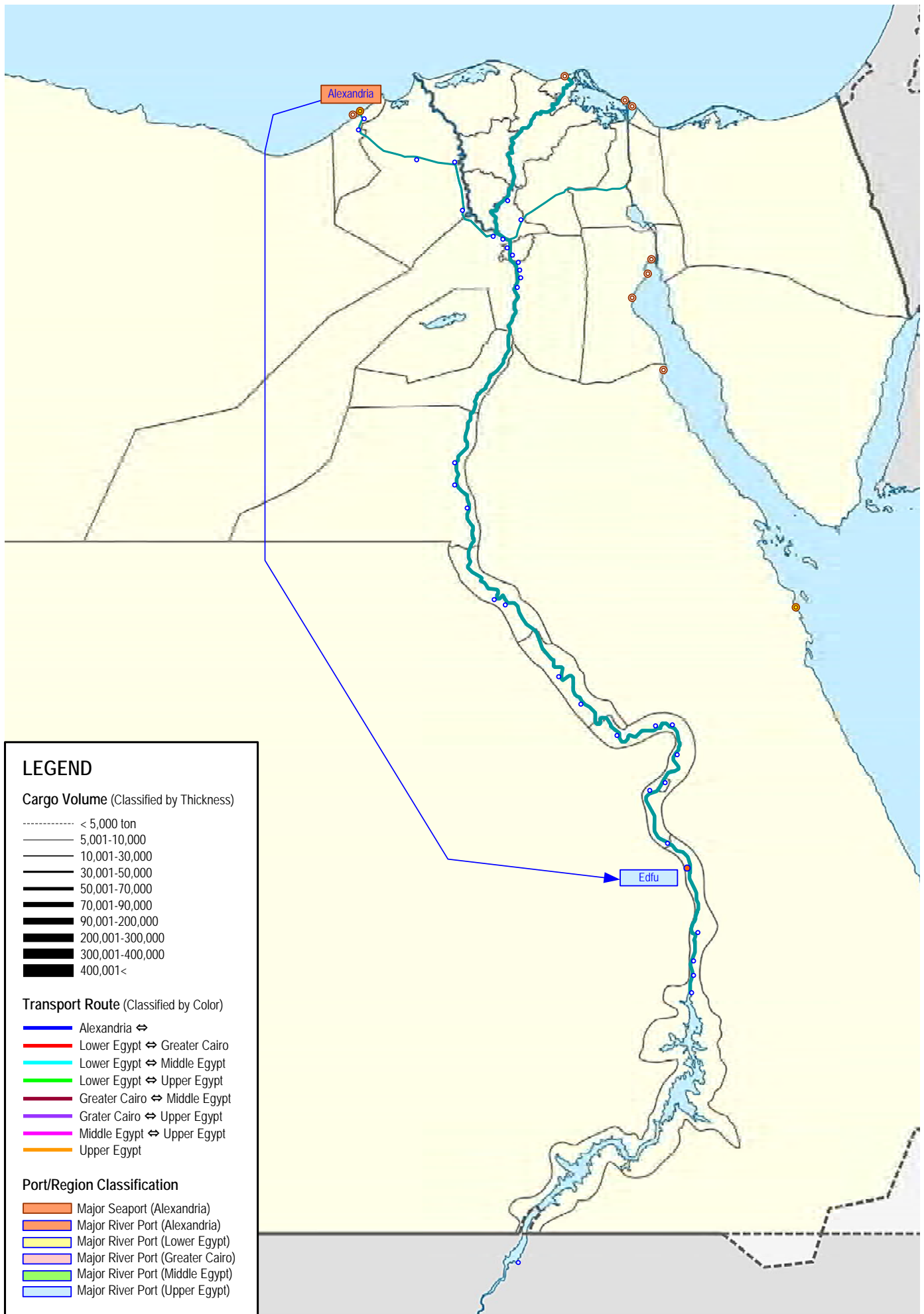




Source: RTA

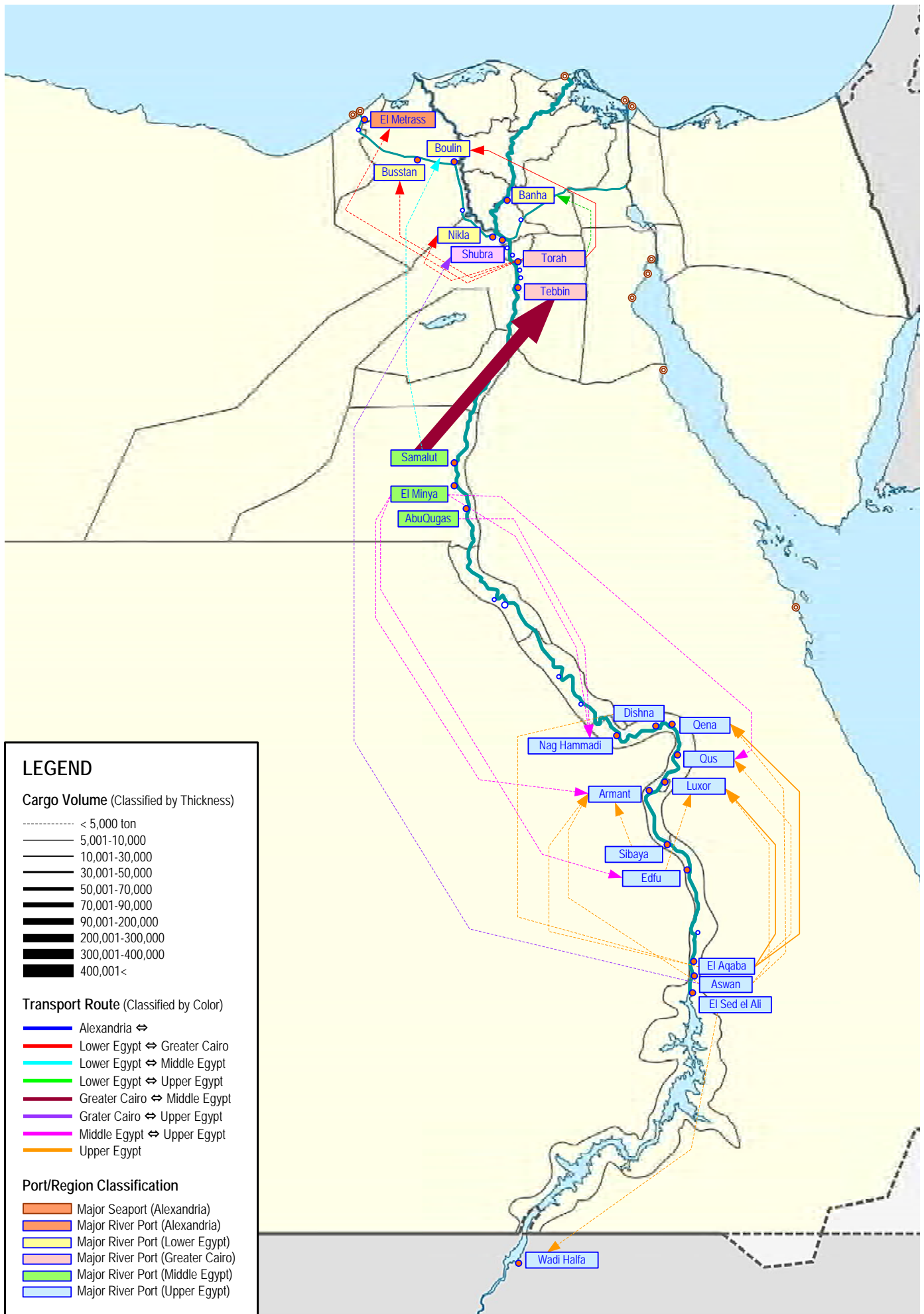
Figure APX3-4 OD Diagram in 2007 (Phosphate)





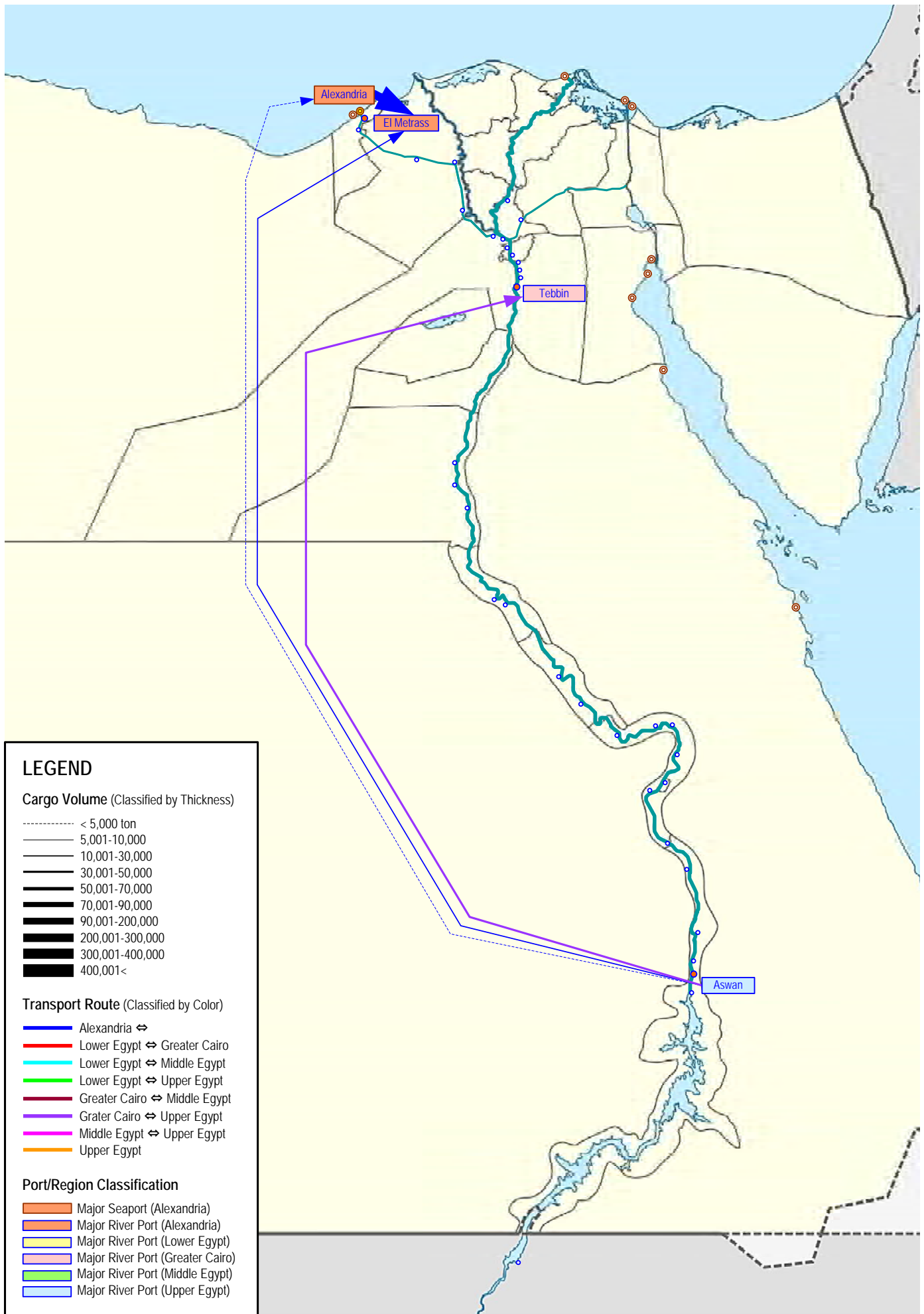
Source: RTA

Figure APX3-5 OD Diagram in 2007 (Coal)



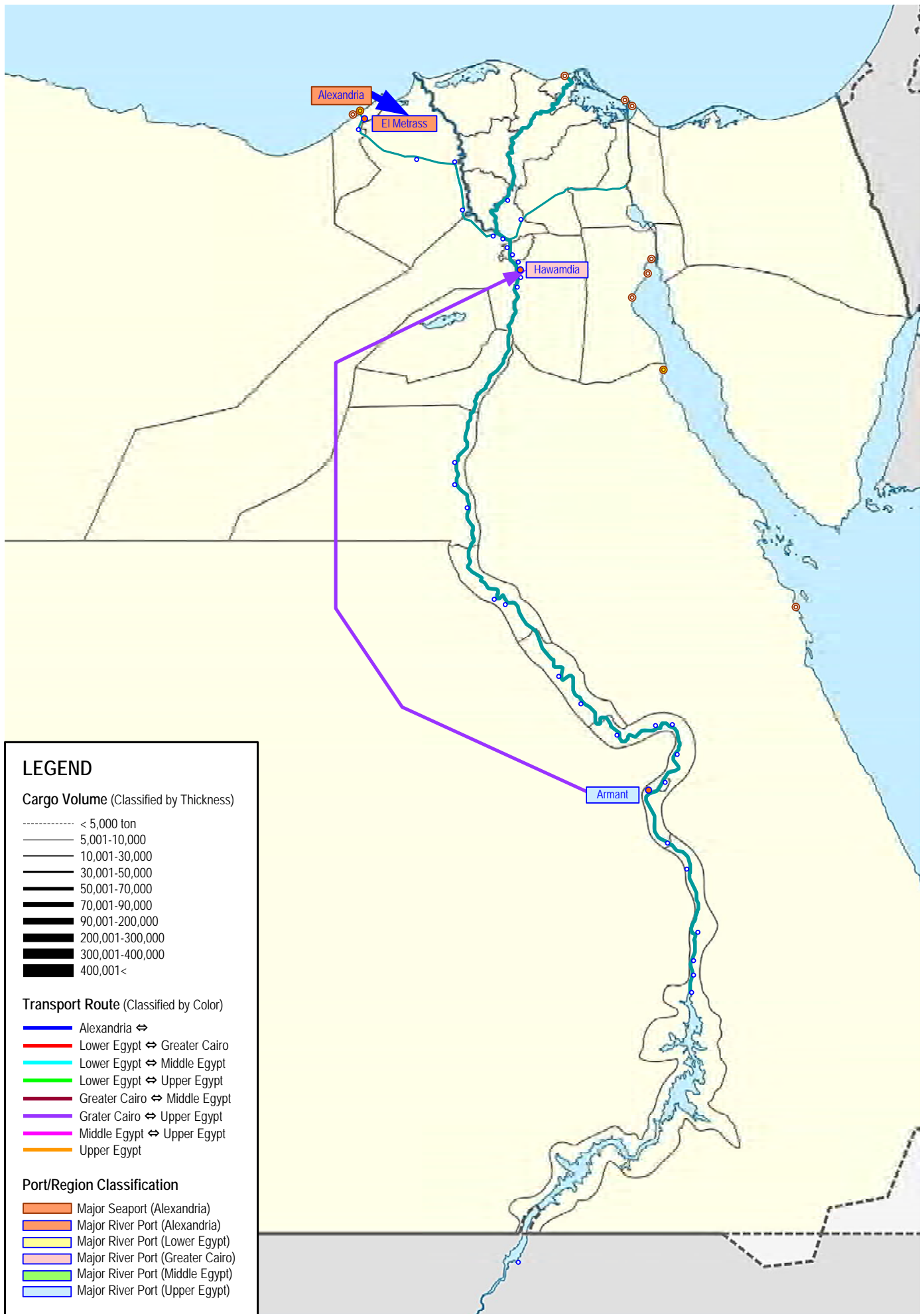
Source: RTA

Figure APX3-6 OD Diagram in 2007 (Stones)



Source: RTA

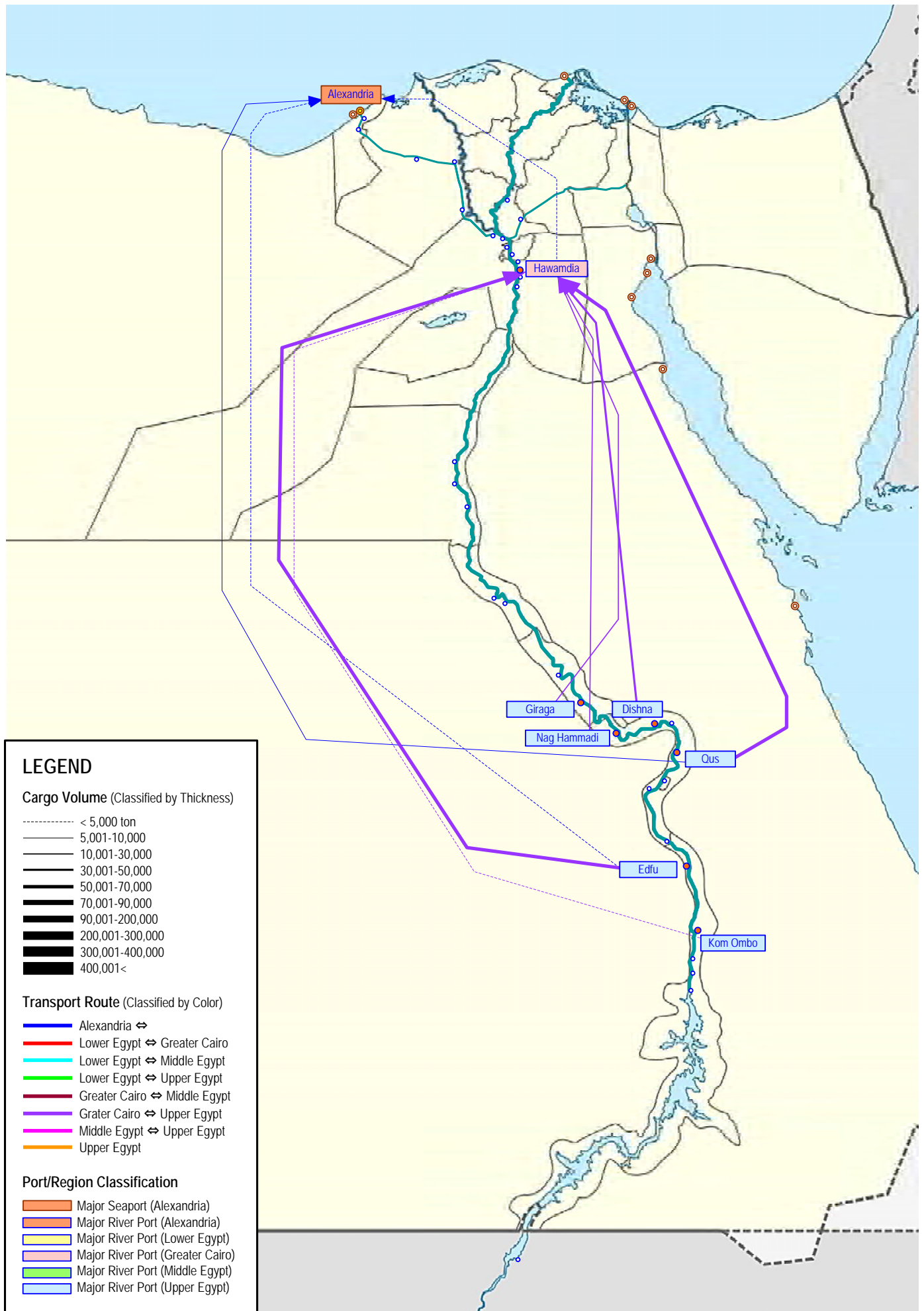
Figure APX3-7 OD Diagram in 2007 (Clay)



Source: RTA

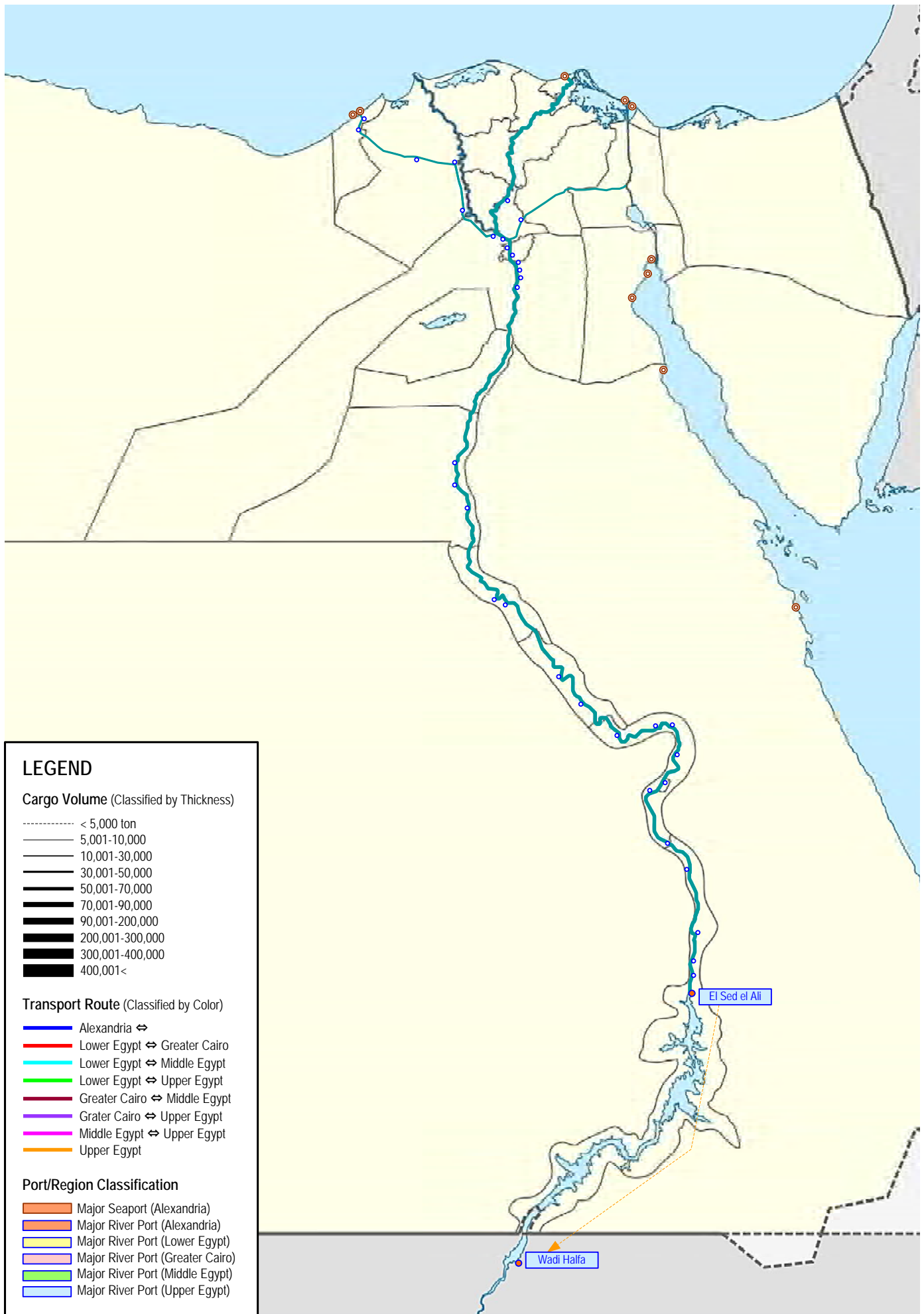
Figure APX3-8 OD Diagram in 2007 (Sulphur)





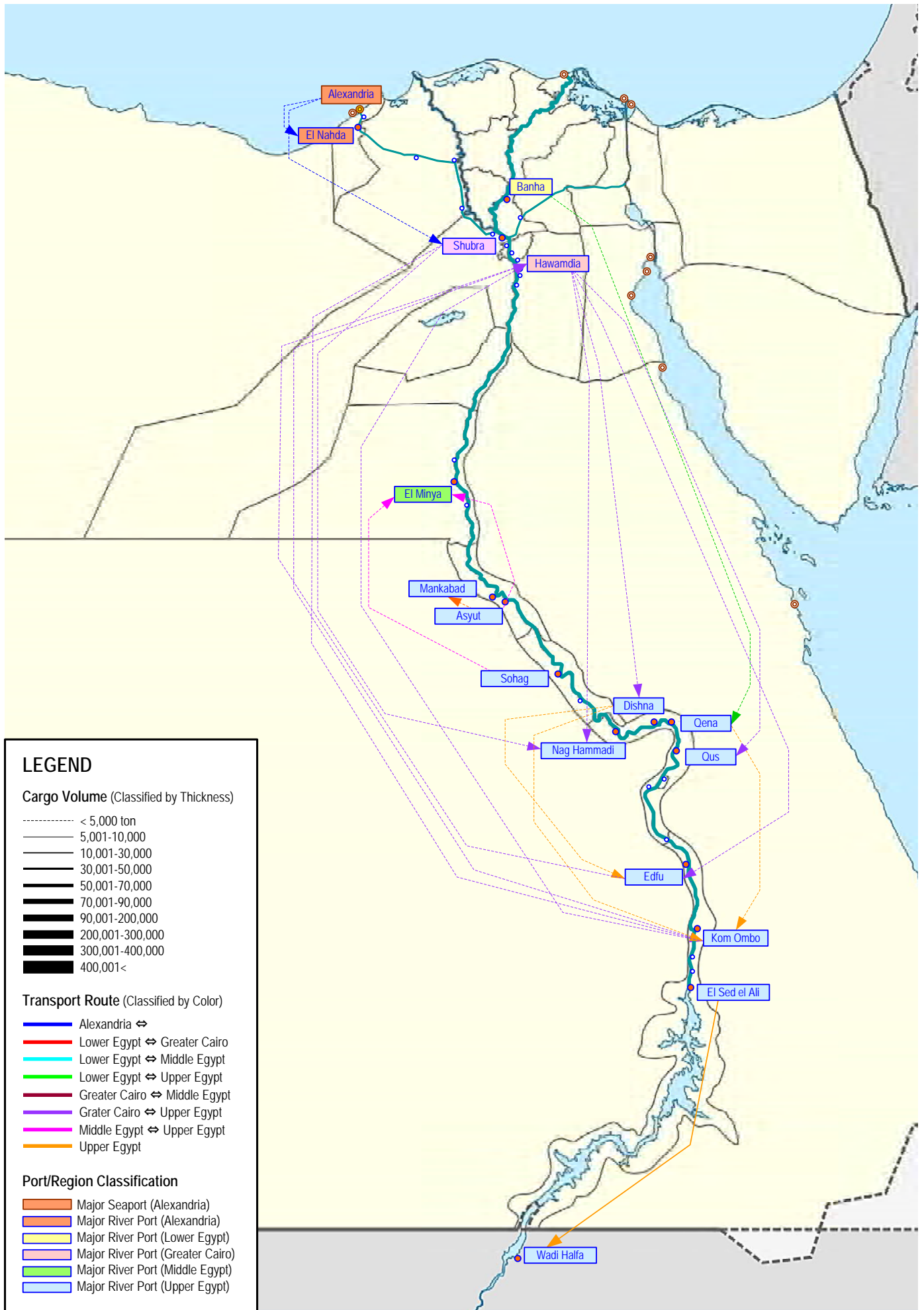
Source: RTA

Figure APX3-9 OD Diagram in 2007 (Molasses)



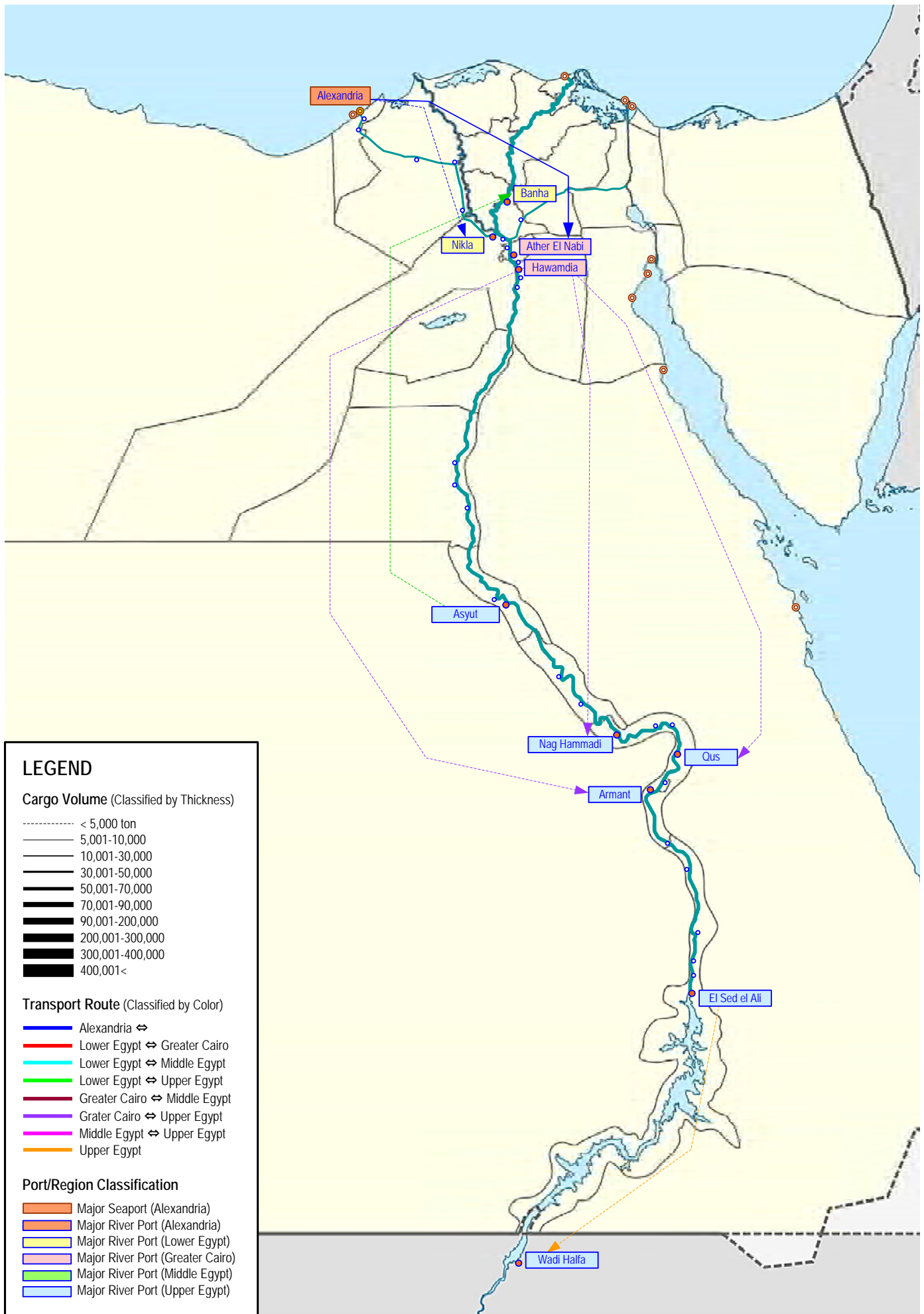
Source: RTA

Figure APX3-10 OD Diagram in 2007 (Fertilizers)



Source: RTA

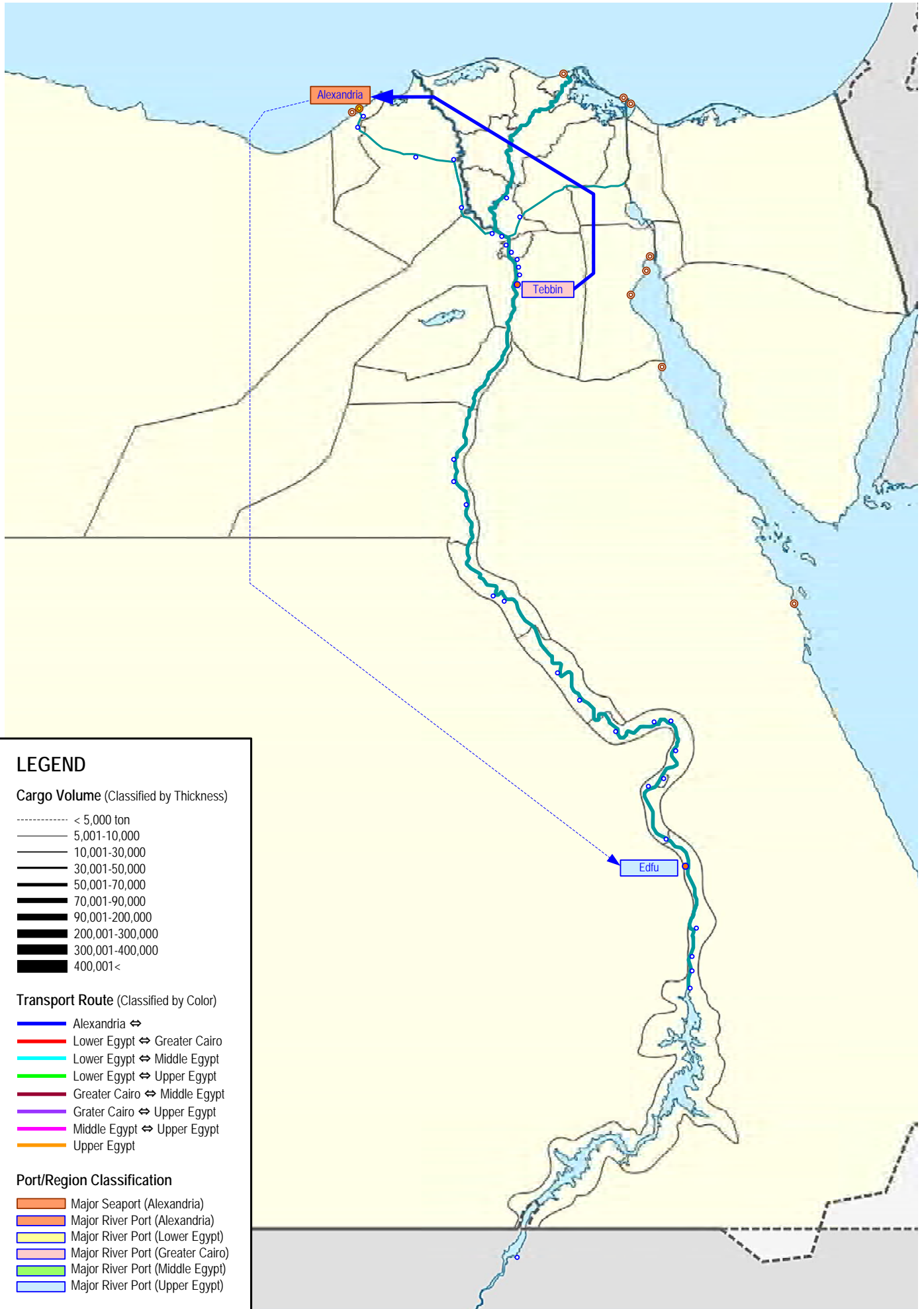
Figure APX3-11 OD Diagram in 2007 (General Cargo)



Source: RTA

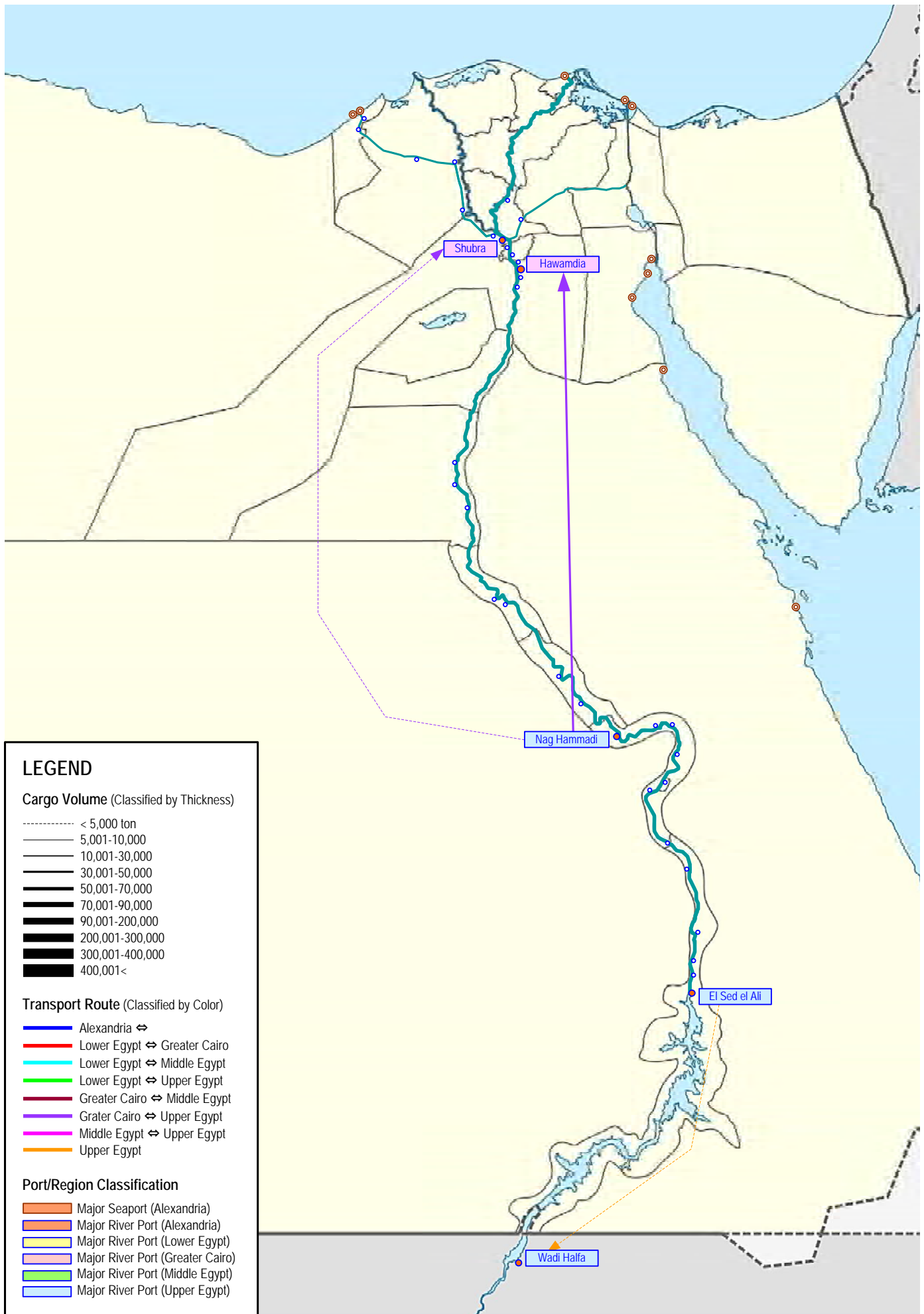
Figure APX3-12 OD Diagram in 2007 (Iron & Steel)





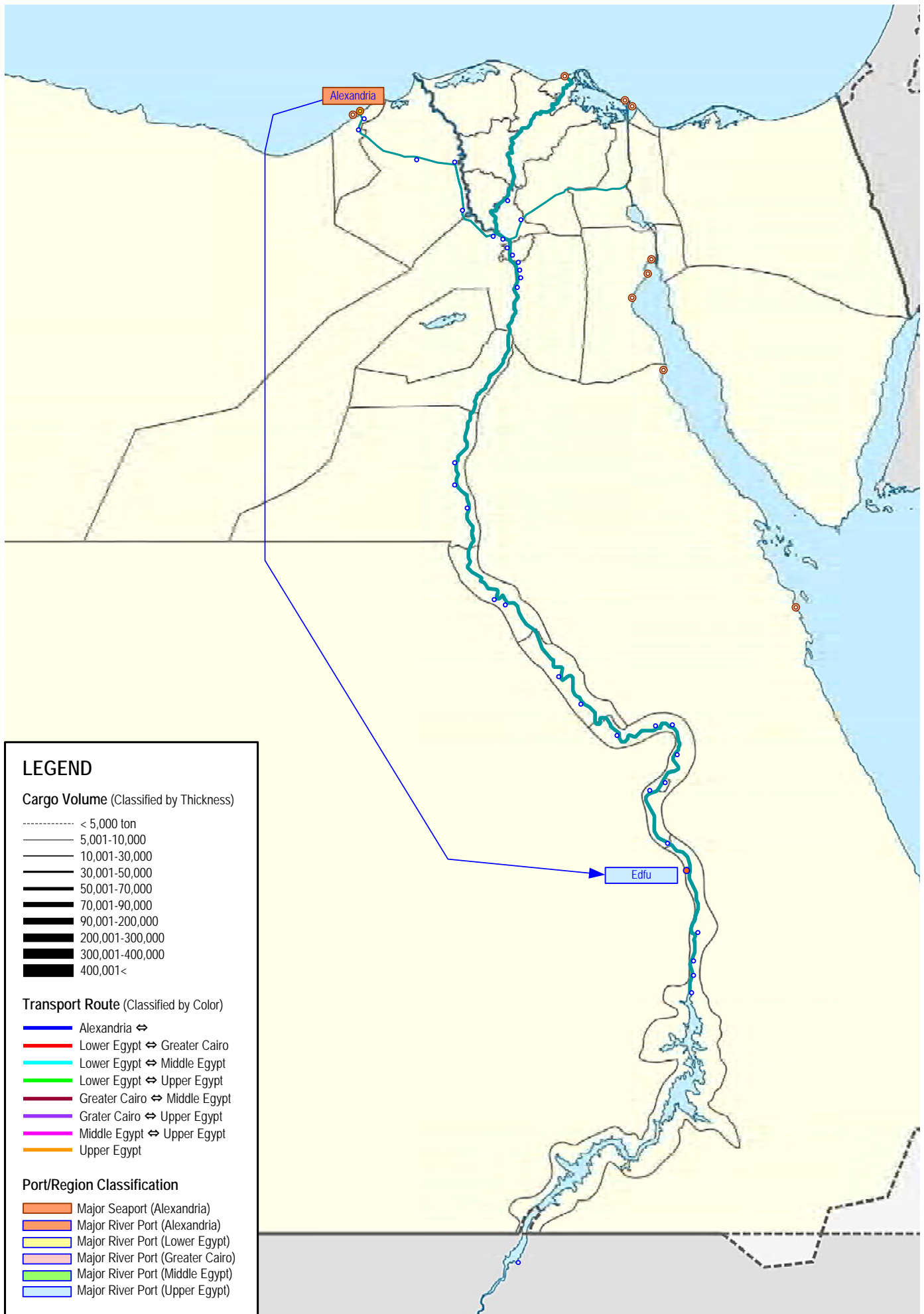
Source: RTA

Figure APX3-13 OD Diagram in 2007 (Coke)



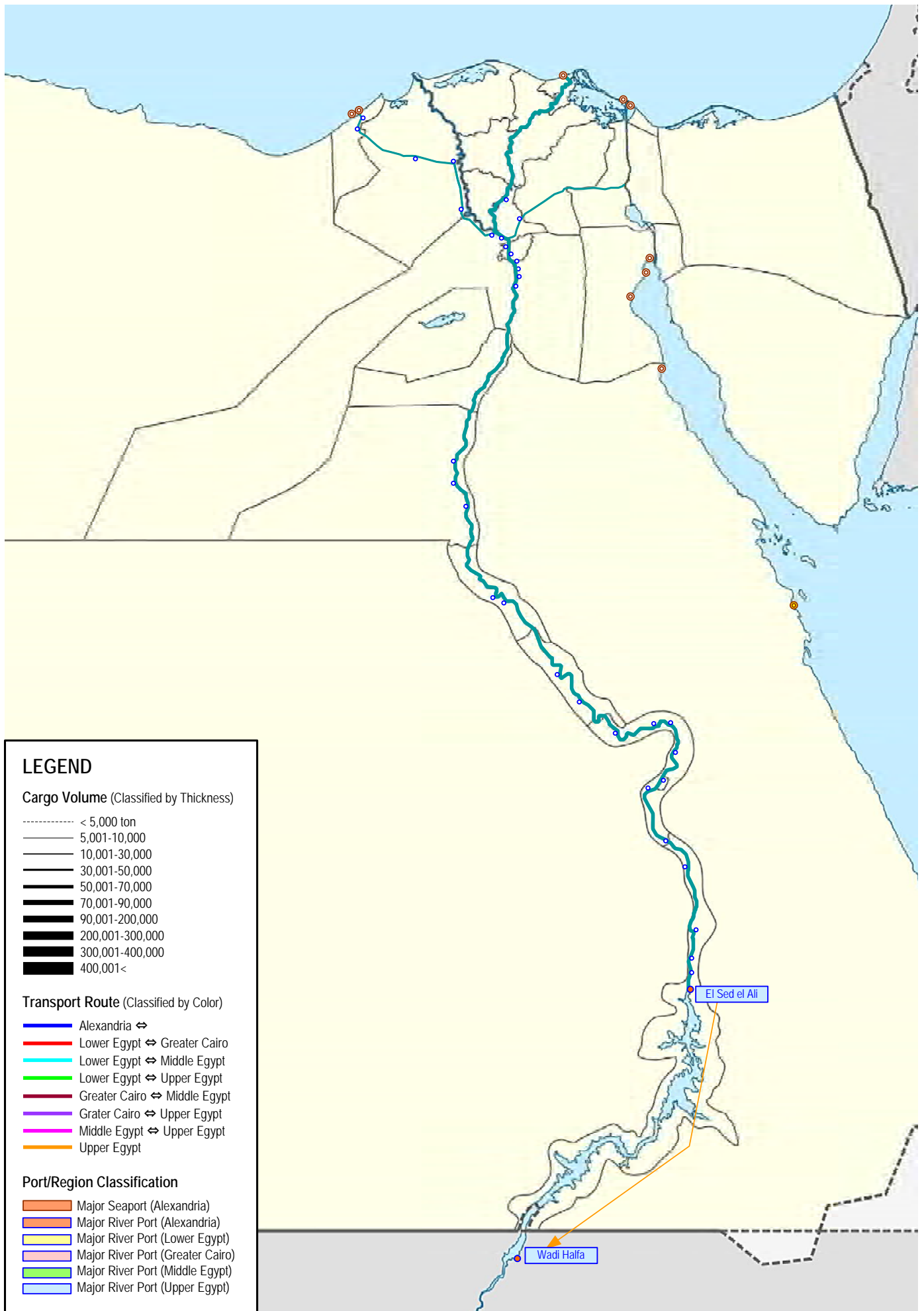
Source: RTA

Figure APX3-14 OD Diagram in 2007 (Aluminum Products)



Source: RTA

Figure APX3-15 OD Diagram in 2007 (Ferro Silicon)



Source: RTA

Figure APX3-16 OD Diagram in 2007 (Food Products)

## APPENDIX-4

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### IW GENERAL INFORMATION





Table APX4-2 Cairo/Aswan Inland Waterway 2/2

Item		Waterway		
Stretching Point/Location/Section Approx. Distance from Aswan Dam (km)		Old Naga Hamadi Barrage Lock 359 (62T)	New Esna Barrage Lock 170 (810)	Aswan Dam 0 (960)
Photograph				
Technical Information	Lock	2 nrs		
	Barrage (Dam)	1 nr		
	Bridge	1 nr		
	Waterway	5 nrs		
	River Port	1 line		
		6 nrs		
	Lock	L 117 m x W 17 m (L 95 m x W 16 m)	L 195 m x W 17 m (x 2 nrs)	L 116 m x W 17 m
	Dimension	Steel open/close type at both up/downstreams	Steel open/close type at both up/downstreams	Steel open/close type at both up/downstreams
	Barrage (Dam)	L 820 m x W 17 m	L 800 m x W 65 m (Dam L 480 m/Power Plant L 100 m)	L 850 m x W 20 m
	Dimension	Steel lifting gate type	Steel mechanical lifting gate type with power plant and dam	Steel lifting gate type
Bridge	Min. L 22 m x Navigable W 16 m	Min. L 37m x Navigable W 38m, Av. air clearance 13m	Min. L 650m x Navigable W 50m, Av. air clearance 13m	
Specification	Steel frame type (fixed)	PC concrete type (fixed)	PC concrete type (fixed)	
Waterway	L 189 km x W 200 - 890 m		L 169 km x W 65 - 950 m	
Dimension	Manned, natural vegetation/concreted bank		Manned, natural vegetation/concreted bank	
Dimension	N/A		N/A	
River Port	N/A		N/A	
Miscellaneous Facility/Structure	Control Bldg., mechanical room and lighting system	Control lower, mechanical room and lighting system	Control lower, mechanical room and lighting system	
Maintenance	Lock			
	Barrage (Dam)	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)
	Bridge			
	Waterway	Every two years (dredging)	Every two years (dredging)	Every two years (dredging)
	River Port			
	Lock	Railing for pedestrian	Railing for pedestrian	Railing for pedestrian
	Barrage (Dam)	Railing for pedestrian	Railing for pedestrian	Railing for pedestrian
	Bridge	Railing for pedestrian	Railing for pedestrian	Railing for pedestrian
	Waterway	Navigation aids/River Information System (RIS)	Navigation aids/River Information System (RIS)	Navigation aids/River Information System (RIS)
	River Port			
Safety & Security	Lock	N/A	N/A	N/A
	Barrage (Dam)	MWRI	MWRI	MWRI
	Bridge	MWRI	MWRI/REE	MWRI
	Waterway	MWRI	MWRI/REE	MWRI
	River Port	Private	Private	Private
	Lock	RTA	RTA	RTA
	Barrage (Dam)	MWRI	MWRI/REE	MWRI
	Bridge	MWRI	MWRI/REE	MWRI
	Waterway	MWRI	MWRI/REE	MWRI
	River Port	Private	Private	Private
Jurisdiction	Lock	GARBLT/Governates/Local Municipalities	GARBLT/Governates/Local Municipalities	GARBLT/Governates/Local Municipalities
	Barrage (Dam)	MWRI	MWRI/REE	MWRI
	Bridge	MWRI	MWRI/REE	MWRI
	Waterway	MWRI	MWRI/REE	MWRI
	River Port	Private	Private	Private
	Lock	RTA	RTA	RTA
	Barrage (Dam)	MWRI	MWRI/REE	MWRI
	Bridge	MWRI	MWRI/REE	MWRI
	Waterway	MWRI	MWRI/REE	MWRI
	River Port	Private	Private	Private
Adjacent Inland Interconnection Possible to Other Sector	Farm and Habitation (regional cities/towns)	Farm and Commercial Area/Habitation (regional city)	Farm and Habitation (regional cities/towns)	
Accessability	Road	Road	Road	
Infrastructure	Good/Excellent (all along regional cities/towns up to Aswan)	Good/Excellent (all along regional cities/towns up to Aswan)	Good/Excellent (all along regional cities/towns up to Aswan)	
Expandability	Poor/Fair (conducted in 1900s)	Good/Excellent (newly constructed in 1970)	Good (good condition with navigation aids & RIS)	
Navigability	Difficult (mainly surrounded by farmland)	Difficult (mainly surrounded by farmland and regional cities/towns)	Partially possible (mainly surrounded by farmland and regional cities/towns)	
Environment	Good (navigable/operational)	Good (navigable/operational)	Good (navigable/operational)	
Particular Issue	Fair (concreted levee but no particular issue observed)	Fair (concreted levee but no particular issue observed)	Fair (concreted levee but no particular issue observed)	
	Non	Non	Non	

Table APX4-3 Cairo/Alexandria Inland Waterway 1/3 (Behety Canal)

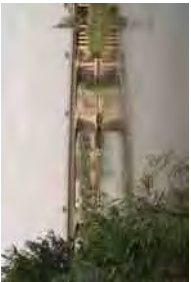

Item		Cairo/Alexandria IW (Behety Canal) 1 of 3			
Stretching Point/Location/Section		Entrance Lock		Boulin Lock	
Approx. Distance from Aswan Dam (km)		953 (0)	995 (42)	1,037 (82)	
Technical Information	Facility/ Structure	Lock	2 rxs - new & old (not used)		
		Barrage (Dam)	1 rr	1 rr	1 rr
		Bridge	4 rns	1 rr	2 rns
		Waterway	1 line	1 line	1 line
	Specification	River Port	-	2 rns (Mida and Khatatba Ports)	-
		Lock	L 116 m x W 16 m (new)	L 116 m x W 16 m	L 116 m x W 16 m
		Type	Steel open/close type at both up/downstreams	Steel open/close type at both up/downstreams	Steel open/close type at both up/downstreams
		Dimension	L 110 m x W 23 m	L 60 m x W 21 m	L 35 m x W 21 m
		Type	Steel lifting gate type	Steel lifting gate type	Steel lifting gate type
		Bridge	Min. L 50 m x Navigable W 17 m. Av. air clearance 6 m PC concrete type (fixed)	Min. L 95 m x Navigable W 25 m. Av. air clearance 6 m PC concrete type (fixed)	Min. L 85 m x Navigable W 25 m. Av. air clearance 6 m PC concrete type (fixed)
Maintenance	Waterway	Dimension	L 42 km x W 65 - 130 m	L 42 km x W 65 - 130 m	
		Type	Manned, natural vegetation bank	Manned, natural vegetation bank	
	River Port	N/A	N/A	N/A	
	Structure	N/A	N/A	N/A	
	Miscellaneous Facility	Control tower, mechanical room and lighting system	Control tower, mechanical room and lighting system	Control tower, mechanical room and lighting system	
	Lock	Beacon light system (navigational aid)	Beacon light system (navigational aid)	Beacon light system (navigational aid)	
	Barrage (Dam)	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)	
	Bridge	Every two years (upon necessity)	Every two years (upon necessity)	Every two years (upon necessity)	
	Waterway	N/A	N/A	N/A	
	River Port	N/A	N/A	N/A	
Safety & Security	Lock	Perimeter fence enclosed, speed limit rule	Perimeter fence enclosed, speed limit rule	Perimeter fence enclosed, speed limit rule	
		Railing for pedestrian	Railing for pedestrian	Railing for pedestrian	
	Barrage (Dam)	Railing for pedestrian	Railing for pedestrian	Railing for pedestrian	
	Bridge	Railing for pedestrian	Railing for pedestrian	Railing for pedestrian	
	Waterway	Navigation aids	Navigation aids	Navigation aids	
	River Port	N/A	N/A	N/A	
	Lock	MWRI	MWRI	MWRI	
	Barrage (Dam)	MWRI	MWRI	MWRI	
	Bridge	GARBLT/Governorates	GARBLT/Governorates	GARBLT/Governorates	
	Waterway	MWRI	MWRI	MWRI	
Jurisdiction	Lock	Private	Private	Private	
		RTA	RTA	RTA	
	Barrage (Dam)	MWRI	MWRI	MWRI	
	Bridge	GARBLT/Governorates/Local Municipalities	GARBLT/Governorates/Local Municipalities	GARBLT/Governorates/Local Municipalities	
	Waterway	MWRI (irrigation/water supply) / RTA (navigation)	MWRI (irrigation/water supply) / RTA (navigation)	MWRI (irrigation/water supply) / RTA (navigation)	
	River Port	Private	Private	Private	
	Adjacent Hinterland	Habitat (regional towns)	Habitat (regional towns)	Habitat (regional towns)	
	Interconnection	Road/Railway	Road/Railway	Road/Railway	
	Possible to Other Sector	Good (approx. 20 km away from the center of Cairo)	Good (approx. 30 km from Cairo/Alex. Desert Rd)	Good (approx. 40-80 km from Cairo/Alex. Desert Rd)	
	Accessibility	Good (conducted in 1970s but well maintained with rehabilitations)	Good (conducted in 1970s but well maintained with rehabilitations)	Good (conducted in 1970s but well maintained with rehabilitations)	
Infrastructure	Good (surrounded by regional towns)	Difficult (surrounded by regional towns)	Possible (mainly surrounded by farmland and local towns)		
	Good (facilities operational and well-maintained/ 15 min. transit time)	Good (facilities operational and well-maintained/ 15 min. transit time)	Possible (mainly surrounded by farmland and local towns)		
Expandability	Good (concreted levee but no particular issue observed)	Good (concreted levee but no particular issue observed)	Poor (garbage and excavated soil left along the both banks)		
	Non	Non	Non		
Navigability	Good (concreted levee but no particular issue observed)	Good (concreted levee but no particular issue observed)	Poor (garbage and excavated soil left along the both banks)		
	Non	Non	Non		
Environment	Good (concreted levee but no particular issue observed)	Good (concreted levee but no particular issue observed)	Poor (garbage and excavated soil left along the both banks)		
	Non	Non	Non		
Particular Issue	Good (concreted levee but no particular issue observed)	Good (concreted levee but no particular issue observed)	Poor (garbage and excavated soil left along the both banks)		
	Non	Non	Non		





Table APX4-4 Cairo/Alexandria Inland Waterway 2/3 (Nubaria Canal 1/2)

Item		Waterway			
Stretching Point/Location/Section		Boulin Lock	Busban Lock	Janakless Lock	
Approx. Distance from Aswan Dam (km)		1,037 (0)	1,065.5 (28.9)	1,099 (62)	
Photograph					
	Lock	1 nr	1 nr	1 nr	
	Barrage (Dam)	1 nr	1 nr	1 nr	
	Bridge	4 rcs	1 nr	1 nr	
	Waterway	1 line	1 line	1 line	
	River Port	-	-	-	
	Lock	L 116 m x W 16 m	L 116 m x W 16 m	L 116 m x W 16 m	
	Barrage (Dam)	Steel open/close type at both up/downstreams	Steel open/close type at both up/downstreams	Steel open/close type at both up/downstreams	
	Bridge	L 35 m x W 21 m	L 52 m x W 21 m	L 35 m x W 15 m	
	Waterway	Steel lifting gate type	Steel lifting gate type	Steel lifting gate type	
Technical Information	Dimension	Min. L 50 m x Navigable W 16 m, Av. air clearance 6 m	Min. L 33 m x Navigable W 16 m, Av. air clearance 6 m	L 90 m x Navigable W 25 m, Av. air clearance 6 m	
	Bridge	PC concrete type (fixed)	PC concrete type (fixed)	PC concrete type (fixed)	
	Waterway	L 29 km x W 80 - 100 m	L 29 km x W 80 - 100 m	L 34 km x W 85 - 95 m	
	River Port	Manned, natural vegetation bank	Manned, natural vegetation bank	Manned, natural vegetation bank	
	Lock	-	N/A	-	
	Barrage (Dam)	-	N/A	-	
	Bridge	Control tower, mechanical room and lighting system	Control tower, mechanical room and lighting system	Control tower, mechanical room and lighting system	
	Waterway	Beacon light system (navigational aids)	Beacon light system (navigational aids)	Beacon light system (navigational aids)	
	River Port	-	-	-	
	Lock	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)	
Maintenance	Barrage (Dam)	-	-	-	
	Bridge	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)	
	Waterway	Every year (dredging)	Every year (dredging)	Every year (dredging)	
	River Port	-	-	-	
	Lock	Perimeter fence enclosed, speed limit rule	Perimeter fence enclosed, speed limit rule	Perimeter fence enclosed, speed limit rule	
	Barrage (Dam)	Railing for pedestrian	Railing for pedestrian	Railing for pedestrian	
	Bridge	-	-	-	
	Waterway	Railing for pedestrian	Railing for pedestrian	Railing for pedestrian	
	River Port	Navigation aids	Navigation aids	Navigation aids	
	Lock	-	N/A	-	
Safety & Security	Barrage (Dam)	MWRI	MWRI	MWRI	
	Bridge	MWRI	MWRI	MWRI	
	Waterway	GARBLT/Governorates	GARBLT/Governorates	GARBLT/Governorates	
	River Port	MWRI	MWRI	MWRI	
	Lock	GARBLT/Governorates	GARBLT/Governorates	GARBLT/Governorates	
	Barrage (Dam)	MWRI	MWRI	MWRI	
	Bridge	GARBLT/Governorates	GARBLT/Governorates	GARBLT/Governorates	
	Waterway	MWRI	MWRI	MWRI	
	River Port	Private	Private	Private	
	Lock	RTA	RTA	RTA	
Jurisdiction	Barrage (Dam)	MWRI	MWRI	MWRI	
	Bridge	GARBLT/Governorates	GARBLT/Governorates	GARBLT/Governorates	
	Waterway	MWRI	MWRI	MWRI	
	River Port	Private	Private	Private	
	Lock	RTA	RTA	RTA	
	Barrage (Dam)	MWRI	MWRI	MWRI	
	Bridge	GARBLT/Governorates/Local Municipalities	GARBLT/Governorates/Local Municipalities	GARBLT/Governorates/Local Municipalities	
	Waterway	MWRI (Inflator/water supply) / RTA (Navigation)	MWRI (Inflator/water supply) / RTA (Navigation)	MWRI (Inflator/water supply) / RTA (Navigation)	
	River Port	Private	Private	Private	
	Lock	Farmland/Habitat (regional town)	Farmland/Habitat (regional town)	Farmland/Habitat (regional town)	
Adjacent Hinterland Interconnection Possible to Other Sector	Road	Road	Road	Road	
	Farmland/Habitat	Farmland/Habitat (regional town)	Farmland/Habitat (regional town)	Farmland/Habitat (regional town)	
	Accessibility	Good/excellent (approx. 10 km from Cairo/Alex, Agricultural Rd.)	Poor/Fair (3840 km from Cairo/Alex, Desert and Agricultural Rds.)	Poor/Fair (3840 km from Cairo/Alex, Desert Rd.)	Good (within 20 km from Cairo/Alex, Desert Rd.)
	Infrastructure	Good (constructed in 1970s but well maintained with rehabilitations)	Poor/Fair (well maintained but the movable bridge restricted)	Poor/Fair (well maintained but the movable bridge restricted)	Good (constructed in 1970s but well maintained with rehabilitations)
	Expandability	Possible (mainly surrounded by farmland)	Possible (mainly surrounded by farmland and local roads)	Possible (mainly surrounded by farmland and local roads)	Difficult (surrounded by local towns)
	Navigability	Good (facilities operational/well-maintained/ 15 min. transit time)	Poor/Fair (still navigable but dredging frequently required)	Poor/Fair (still navigable but dredging frequently required)	Good (operational and well maintained)
	Environment	Fair (no influences of contaminated water observed)	Poor/Fair (dredged materials left along the both road sides)	Poor/Fair (dredged materials left along the both road sides)	Fair (concreted levees but no particular issue observed)
	Particular Issue	Non	Sedimentation frequently occurred	Sedimentation frequently occurred	Non

Table APX4-5 Cairo/Alexandria Inland Waterway 2/3 (Nubaria Canal 1/2)

Waterway		Cairo/Alexandria IW (Nubaria Canal) 3 of 3		
Item	Stretching Point/Location/Section Approx. Distance from Aswan Dam (km)	Jankhless Lock 1097 (62)	El Nahda Lock 1138 (101)	End Lock 1158 (121)
Photograph				
Facility/Structure	Lock	1 nr	1 nr	2 ins (Big and Small Locks)
	Barrage (Dam)	1 nr	1 nr	1 nr
Technical Information	Bridge	4 rcs	1 line	1 line
	Waterway	1 line	1 line	2 ports (Nahda and Mirass Ports)
Specification	Lock	L 116 m x W 16 m	L 116 m x W 16 m	Big: L 116 m x W 16 m, Small: L 55 m x 16 m
	Barrage (Dam)	Steel open/close type at both up/downstreams	Steel open/close type at both up/downstreams	Steel open/close types at both up/downstreams
Miscellaneous Facility/Structure	Lock	L 35 m x W 15 m		
	Bridge	Steel lifting gate type		
Maintenance	Lock	Min. L 136 m x Navigable W 25 m, Av. air clearance 6 m	Min. L 21 m x Navigable W 16 m, Av. air clearance 6 m	Min. L 70 m x Navigable W 16 m, Av. air clearance 3.5 m
	Waterway	PC concrete type (fixed)	PC concrete type (fixed)	PC concrete type (fixed)
Safety & Security	Lock	L 39 km x W 50 - 100 m	L 39 km x W 50 - 100 m	L 20 km x W 35 - 100 m
	Waterway	Manned, natural vegetation bank	Manned, natural vegetation bank	Manned, natural vegetation bank
Ownership	Lock			N/A
	Barrage (Dam)			N/A
Jurisdiction	Lock	Control tower, mechanical room and lighting system	Control tower, mechanical room and lighting system	Control tower, mechanical room and lighting system
	Waterway	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)
Adjacent Hinterland	Lock	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)
	Waterway	Every year (dredging)	Every year (dredging)	Approx. two years (upon necessity)
Interconnection Possible to Other Sector	Lock	Perimeter fence enclosed, speed limit rule	Perimeter fence enclosed, speed limit rule	Area restricted by Alexandria Port, speed limit rule
	Waterway	Railing for pedestrian	Railing for pedestrian	Railing for pedestrian
Accessibility	Lock	Navigation aids	Navigation aids	Navigation aids
	Waterway			N/A
Infrastructure	Lock	MWRI	MWRI/RTA	MWRI
	Barrage (Dam)	MWRI	MWRI	MWRI
Expandability	Lock	GARBLT/Governorates	GARBLT/Governorates	GARBLT/Governorates
	Waterway	MWRI	MWRI	MWRI
Navigability	Lock	RTA	RTA	RTA
	Barrage (Dam)	MWRI	MWRI	MWRI
Environment	Lock	GARBLT/Governorates/Local Municipalities	GARBLT/Governorates/Local Municipalities	GARBLT/Governorates/Local Municipalities
	Waterway	MWRI (irrigation/water supply) / RTA (navigation)	MWRI (irrigation/water supply) / RTA (navigation)	MWRI (irrigation/water supply) / RTA (navigation)
Particular Issue	Lock	Habitat, farmland	Industrial zone/Habitat (regional cities/towns)	Port restricted area
	Waterway	Road	Road	Road
Particular Issue	Lock	Good (within 20 km from Cairo/Alex, Desert Rd.)	Fair/Good (<10 km from Cairo/Alex, Desert Rd.)	Good/Excellent (within 1 km from main roads in Alexandria)
	Waterway	Good (constructed in 1970s but well maintained with rehabilitations)	Excellent (well maintained and new lock under construction)	Poor/Fair (well maintained but limited air clearance constrained)
Particular Issue	Lock	Difficult (surrounded by local towns)	Possible (second lock construction on-going)	Impossible (surrounded by port facilities)
	Waterway	Good (operational and well maintained)	Fair/Good (facilities operational/well maintained but transit time longer)	Poor/Fair (operational but small air clearance)
Particular Issue	Lock	Fair (concrete levee but no particular issue observed)	Poor/Fair (dragged materials left along the both road sides)	Poor/Fair (possible salt wedge arisen immeasurable)
	Waterway	Non	Sedimentation frequently occurred	Small lock expansion project suspended Air clearance restricted

Table APX4-6 Cairo/Damietta Inland Waterway 1/2

Item		Waterway	
Stretching Point/Location/Section		New Delta Barrage Lock	Damietta Lock
Approx. Distance from Aswan Dam (km)		953 (0)	1,176 (223)
Photograph			
Facility/Structure	Lock	1 nr	1 nr
	Barrage (Dam)	1 nr	1 nr
Technical Information	Bridge	6 rcs	8 rcs
	Waterway	1 line	1 line
Specification	River Port	1 nr (Banha Port)	1 nr (Banha Port)
	Lock	L 150 m x W 17 m	L 150 m x W 17 m (new)
Miscellaneous Facility/Structure	Lock	Steel open/close type at both up/downstreams	Steel open/close type at both up/downstreams
	Barrage (Dam)	L 370 m x W 22 m	L 370 m x W 21 m
Ownership	Bridge	Min. L 30 m x Navigable W 12 m	Min. L 30 m x Navigable W 20 m (Av. air clearance 13 m)
	Waterway	Steel frames swing type (movable)	PC concrete/steel frame type (fixed/swing type (movable))
Jurisdiction	Lock	L 89 km x W 65 - 350 m	L 42 km x W 65 - 730 m
	Barrage (Dam)	N/A	Marmada, natural vegetation bank
Safety & Security	Bridge	N/A	N/A
	Waterway	Control tower, mechanical room and lighting system	Control tower, mechanical room and lighting system
Environment	Lock	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)
	Barrage (Dam)	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)
Particular Issue	Waterway	Every two years (dredging/upon necessity)	Every two years (dredging)
	River Port	N/A	N/A
Accessibility	Lock	Perimeter fence, railing, speed limit rule	Perimeter fence, railing, speed limit rule, signalization
	Barrage (Dam)	Railing for pedestrian	Railing for pedestrian
Infrastructure	Bridge	Railing for pedestrian	Railing for pedestrian
	Waterway	Navigation aids (on-gang)	Navigation aids
Expandability	Lock	N/A	N/A
	Barrage (Dam)	RTA	RTA
Navigability	Bridge	MWRI	MWRI
	Waterway	RTA/GARBLT/Governorates	GARBLT/ENR/Governorates
Environment	Lock	Private	Private
	Barrage (Dam)	ENR/GARBLT/Governorates	GARBLT/ENR/Governorates
Particular Issue	Bridge	MWRI	MWRI
	Waterway	GARBLT/Governorates/Local Municipalities	GARBLT/ENR/Governorates/Local Municipalities
Particular Issue	Lock	Private	Private
	Barrage (Dam)	Farm/Industrial Zone/Habitat (regional cities/towns)	Farm/Industrial Zone/Habitat (regional cities/towns)
Particular Issue	Waterway	Habitat (regional towns)	Farm/Industrial Zone/Habitat (regional cities/towns)
	River Port	Road/Railway	Road
Particular Issue	Lock	Good (approx. 20 km away from the center of Cairo)	Good (within 10 km from regional trunk Rds.)
	Barrage (Dam)	Good/Excellent (lock newly constructed but bridge operation restricted)	Excellent (lock newly constructed)
Particular Issue	Waterway	Difficult (surrounded by regional towns but some space available)	Difficult (mainly surrounded by farmland and local cities/towns)
	River Port	Good (enough dimensions and operational)	Fair/Good (operational/navigable)
Particular Issue	Lock	Fair (concreted levee but no particular issue observed)	Fair (concreted levee but no particular issue observed)
	Barrage (Dam)	Non	Non
Particular Issue	Waterway	Non	Non
	River Port	Non	Non

Source: JICA Study Team

Table APX4-7 Cairo/Damietta Inland Waterway 2/2

Item		Waterway	
Stretching Point/Location/Section Approx. Distance from Aswan Dam (km)		Damietta Lock 1,176 (223)	Connection Canal -
Photograph			
Facility/Structure		Lock 1 nr Barrage (Dam) 1 nr Bridge 1 nr Waterway - River Port -	Connection Canal - 2 nrs 1 line 1 line -
Technical Information		Dimension L: 150 m x W: 16 m Type Steel open/case types at both up/downstreams Barrage (Dam) L: 35 m x W: 21 m (L: 250 m x W: 60 m) Type Steel lifting gate type (earth fill dam) Bridge Min. L: 30 m x Navigable W: 16 m Type Steel lifting type (movable) Waterway - River Port -	Min. L: 170 m x Navigable W: 50 m. A/c clearance: 15 m PC concrete/steel frame type (fixed) - L: 7.5 km x W: 110-370 m Nile branch -
Miscellaneous Facility/Structure		Control building, mechanical room and lighting system	Bescom light system (on-going)
Maintenance		Lock - Barrage (Dam) - Bridge - Waterway - River Port -	- - Approx. every two years (upon necessity) - Every two years (dredging/upon necessity) -
Safety & Security		Lock - Barrage (Dam) - Bridge - Waterway - River Port -	- - Perimeter fence enclosed, speed limit rule Non - Railing for pedestrian Navigation aids (on-going) -
Jurisdiction		Lock MWRI Barrage (Dam) MWRI/GARBLT Bridge MWRI Waterway - River Port RTA Lock MWRI Barrage (Dam) MWRI Bridge MWRI Waterway -	- - - GARBLT/Governorates MWRI - - - - GARBLT/Governorates MWRI - - GARBLT/Governorates/Local Municipalities MWRI (irrigation/water supply) / RTA (navigation) - Port Area/Industrial Zone Seaport/Road
Adjacent Hinterland Interconnection Possible to Other Sector		Farmland/Habitat (regional towns) - Good (c. 10 km from regional trunk Rds.) - Good (constructed in 1970s but well maintained with rehabilitations) - Difficult (mainly surrounded by farmland and habitation) - Good (enough dimensions and operational) - Fair (no affluences of contaminated water observed) - Movable bridges operation restricted	Seaport/Road Good/Excellent (within 3 km from Damietta Port) Good (good condition maintained but navi. aids not provided) Possible (mainly surrounded by farmland/new development areas) Fair/Good (operational/navigable) Fair (concreted levee but no particular issue observed) Navi. Aids required
Accessibility		Good (c. 10 km from regional trunk Rds.)	Good/Excellent (within 3 km from Damietta Port)
Infrastructure		Good (constructed in 1970s but well maintained with rehabilitations)	Good (good condition maintained but navi. aids not provided)
Expandability		Difficult (mainly surrounded by farmland and habitation)	Possible (mainly surrounded by farmland/new development areas)
Navigability		Good (enough dimensions and operational)	Fair/Good (operational/navigable)
Environment		Fair (no affluences of contaminated water observed)	Fair (concreted levee but no particular issue observed)
Particular Issue		Movable bridges operation restricted	Navi. Aids required

Source: JICA Study Team

Table APX4-8 Cairo/Ismailia Inland Waterway 1/3 (Ismailia Canal)



Waterway		Cairo/Ismailia IW (Ismailia Canal) 1 of 3		
Item	Stretching Point/Location/Section Approx. Distance from Aswan Dam (km)	Entrance Lock 1,021 (0)	Serjakos Lock 1,034 (13)	El Monir Lock 1,049 (15)
Photograph				
Technical Information	Facility/Structure	Lock	1 nr	1 nr
		Barrage (Dam)	2 ms (new & old (not used))	1 nr
	Specification	Bridge	12 ms	4 ms
		Waterway	2 ms (new & old (not used))	1 ms
		River Port	1 ms	1 port (Abu Zabel Port)
Maintenance	Lock	Lock	L 116 m x W 17 m	L 116 m x W 17 m
		Barrage (Dam)	Steel open/close type at both up/downstreams	Steel open/close type at both up/downstreams
	Waterway	Waterway	L 40 m x W 21 m	L 64 m x W 33 m
		Bridge	Steel lifting gate type	Steel lifting gate type
		Waterway	Min. L 50 m x Navigable W 16 m Steel frame truss type (on barrages)	Min. L 85 m x Navigable W 10 m, Av. air clearance 5 m PC concrete type (steel frame filling & swing types)
Safety & Security	Lock	Lock	L 13 km x W 65 - 85 m	L 15 km x W 40 - 100 m
		Barrage (Dam)	Mainmade, natural vegetation bank	Mainmade, natural vegetation bank
	Waterway	Waterway	-	-
		Bridge	-	-
		Waterway	-	-
Jurisdiction	Ownership	Lock	Non	Non
		Barrage (Dam)	Mechanical room and lighting system	Mechanical room and lighting system
	Operation & Maintenance	Waterway	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)
		Bridge	Approx. every two years (upon necessity)	Approx. every two years (upon necessity)
		Waterway	N/A	N/A
Adjacent Hinterland Interconnection Possible to Other Sector	Accessibility	Lock	Perimeter fence enclosed, speed limit rule	Perimeter fence enclosed, speed limit rule
		Barrage (Dam)	Railing for pedestrian	Railing for pedestrian
	Infrastructure	Waterway	Railing for pedestrian	Railing for pedestrian
		Bridge	Non	Non
		Waterway	Non	Non
Particular Issue	Expandability	Lock	MWRI	MWRI
		Barrage (Dam)	MWRI	MWRI
	Navigability	Waterway	MWRI/GARBLT/Governorates	MWRI
		Bridge	MWRI	MWRI
		Waterway	MWRI	MWRI
Environment	Particular Issue	Lock	MWRI	MWRI
		Barrage (Dam)	MWRI	MWRI
	Particular Issue	Waterway	MWRI/GARBLT/Governorates	MWRI
		Bridge	MWRI	MWRI
		Waterway	MWRI	MWRI



Table APX4-9 Cairo/Ismailia Inland Waterway 2/3 (Ismailia Canal)

Item		Waterway		Cairo/Ismailia IW (Ismailia Canal) 2 of 3			
Stretching Point/Location/Section Approx. Distance from Aswan Dam (km)		El Monir Lock 1,049 (15)		El Salheya Lock 1,096 (47)		Ismailia Lock 1,148 (52)	
Photograph							
		1 nr		1 nr		1 nr	
Facility/ Structure	Barrage (Dam)	1 nr		1 nr		1 nr	
	Bridge	14 nrs		23 nrs		-	
Technical Information	Waterway	1 line		1 line		-	
	River Port	-		-		-	
	Lock	L 116 m x W 17 m		L 116 m x W 17 m		L 38.5 m x W 8.5 m	
	Dimension	Steel open/case type at both up/downstreams		Steel open/case type at both up/downstreams		Steel open/case type at both up/downstreams	
	Type	-		-		-	
	Barrage (Dam)	L 65 m x W 27 m		L 52 m x W 21 m		-	
	Type	Steel lifting gate type		Steel lifting gate type		-	
	Dimension	Min. L 80 m x Navigable W 12 m, Av. air clearance 4.5 m		Min. L 50 m x W 17 m		Min. L 30 m x Navigable W 12m, Av. air clearance 6 m	
	Bridge	PC concrete type (fixed)		PC concrete type (fixed)		PC concrete type (fixed)/steel frame lifting & swing types	
	Waterway	L 47 km x W 60 - 90 m		-		L 52 km x W 10 - 70 m	
Dimension	-		-		-		
Type	-		-		-		
River Port	-		-		-		
Type	-		-		-		
Miscellaneous Facility/Structure	Control bldg., mechanical room and lighting system		Control bldg., mechanical room and lighting system		-		
Maintenance	Lock	-		-		Probably not executed	
	Barrage (Dam)	Approx. every two years (upon necessity)		Approx. every two years (upon necessity)		-	
	Bridge	-		-		-	
	Waterway	Every year (dredging)		-		-	
Safety & Security	River Port	-		-		-	
	Lock	Perimeter fence enclosed, speed limit rule		Perimeter fence enclosed, speed limit rule		Non	
	Barrage (Dam)	-		-		-	
	Bridge	Railing for pedestrian		Railing for pedestrian		-	
Jurisdiction	Waterway	-		-		-	
	River Port	-		-		-	
	Lock	MWRI		MWRI		MWRI	
	Barrage (Dam)	MWRI		MWRI		MWRI	
Ownership	Bridge	GARBLET/ENR/Governorates		GARBLET/ENR/Governorates		GARBLET/ENR/Governorates	
	Waterway	-		-		-	
	River Port	-		-		-	
	Lock	-		-		-	
Operation & Maintenance	Bridge	MWRI		MWRI		MWRI	
	Waterway	GARBLET/ENR/Governorates/Local Municipalities		GARBLET/ENR/Governorates/Local Municipalities		GARBLET/ENR/Governorates/Local Municipalities	
	River Port	MWRI (Inigation/water supply) / RTA (Navigation)		MWRI (Inigation/water supply) / RTA (Navigation)		MWRI (Inigation/water supply) / RTA (Navigation)	
	Waterway	-		-		-	
Adjacent Hinterland Interconnection Possible to Other Sector	River Port	Famland/Habitation (regional towns)		Famland/Habitation (regional towns)		Famland/Habitation (regional city/towns)	
	Waterway	Road		Road		Road	
Accessibility	Lock	Fair/Good (along Ismailia-Cairo Rd)		Fair/Good (along Ismailia-Cairo Rd)		Good/Excellent (along Ismailia-Cairo Rd/within Ismailia city)	
	Waterway	Poor/Fair (not frequently used and required to be reconditioned)		Poor/Fair (sedimentation occurred/many bridges existed)		Bad (narrow waterway width)	
Infrastructure	Bridge	Possible (mainly surrounded by farmland)		Possible (mainly surrounded by farmland)		Impossible (surrounded by regional city)	
	Waterway	Poor/Fair (required to maintenance periodically)		Poor (narrow navigable width in the existing bridge)		Bad (navigation restricted)	
Expandability	Lock	Fair		Poor/Fair (concrete levee but no particular issue observed)		Fair (concrete levee but no particular issue observed)	
	Waterway	Lock required to be reconditioned		Lock required to be reconditioned		Smaller dimensions not fit for standard barge system	
Navigability	Lock	-		-		-	
	Waterway	-		-		-	
Environment	Lock	-		-		-	
	Waterway	-		-		-	
Particular Issue	Lock	-		-		-	
	Waterway	-		-		-	

Table APX4-10 Cairo/Ismaïlia Inland Waterway 3/3 (Ismaïlia Canal)

Item		Waterway	
Stretching Point/Location/Section Approx. Distance from Aswan Dam (km)		Ismaïlia Lock 1,148 (52)	End Lock 1,149 (7)
Photograph			
Facility/ Structure	Lock		
	Barrage (Dam) Bridge Waterway River Port	- - - -	- - - -
Technical Information	Lock	1 nr	1 nr
	Dimension Type	L 38.5 m x W 8.5 m	L 38.5 m x W 8.5 m
	Dimension Type	Steel open/close type at both up/downstreams	Steel open/close type at both up/downstreams
	Dimension Type	-	-
	Dimension Type	Min. L 15 m x Navigable W 8.5 m, Av. air clearance 3.5 m	-
Specification	Dimension Type	PC concrete type (fixed) steel frame filling & swing types	-
	Dimension Type	L 1 km x W 8.5 - 78 m	-
	Dimension Type	Manmade, natural vegetation/concrete bank	-
	Dimension Type	-	-
	Dimension Type	-	-
Miscellaneous Facility/Structure	Lock	Non	Non
	Barrage (Dam)	Probably not executed	Probably not executed
	Bridge	-	-
	Waterway	N/A	-
	River Port	N/A	-
	Lock	-	-
	Barrage (Dam)	-	-
	Bridge	-	-
	Waterway	-	-
	River Port	-	-
Maintenance	Lock	-	-
	Barrage (Dam)	-	-
	Bridge	-	-
	Waterway	-	-
	River Port	-	-
Safety & Security	Lock	-	-
	Barrage (Dam)	-	-
	Bridge	-	-
	Waterway	-	-
	River Port	-	-
Ownership	Lock	MWRI	MWRI
	Barrage (Dam)	-	-
	Bridge	-	-
	Waterway	-	-
	River Port	-	-
Jurisdiction	Lock	MWRI	MWRI
	Barrage (Dam)	-	-
	Bridge	-	-
	Waterway	-	-
	River Port	-	-
Operation & Maintenance	Lock	-	-
	Barrage (Dam)	-	-
	Bridge	-	-
	Waterway	-	-
	River Port	-	-
Adjacent Hinterland Interconnection Possible to Other Sector	Lock	Commercial Area/Habitat (Ismaïlia city)	Commercial Area/Habitat (Ismaïlia city)
	Barrage (Dam)	Good/Excellent (along Ismaïlia-Cairo Rd/within Ismaïlia city)	Good/Excellent (along Ismaïlia-Cairo Rd/within Ismaïlia city)
	Bridge	Bad (narrow waterway width)	Bad (narrow waterway width)
	Waterway	Impossible (surrounded by regional city)	Impossible (surrounded by regional city)
	River Port	Bad (navigation restricted)	Bad (navigation impossible for standard barge system)
Accessibility	Lock	Good/Excellent (along Ismaïlia-Cairo Rd/within Ismaïlia city)	Good/Excellent (along Ismaïlia-Cairo Rd/within Ismaïlia city)
	Barrage (Dam)	Bad (narrow waterway width)	Bad (narrow waterway width)
	Bridge	Impossible (surrounded by regional city)	Impossible (surrounded by regional city)
	Waterway	Bad (navigation restricted)	Bad (navigation impossible for standard barge system)
	River Port	Fair (concrete levee but no particular issue observed)	Fair (concrete levee but no particular issue observed)
Infrastructure	Lock	-	-
	Barrage (Dam)	-	-
	Bridge	-	-
	Waterway	-	-
	River Port	-	-
Expandability	Lock	-	-
	Barrage (Dam)	-	-
	Bridge	-	-
	Waterway	-	-
	River Port	-	-
Navigability	Lock	-	-
	Barrage (Dam)	-	-
	Bridge	-	-
	Waterway	-	-
	River Port	-	-
Environment	Lock	-	-
	Barrage (Dam)	-	-
	Bridge	-	-
	Waterway	-	-
	River Port	-	-
Particular Issue	Lock	-	-
	Barrage (Dam)	-	-
	Bridge	-	-
	Waterway	-	-
	River Port	-	-

## APPENDIX-5

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### BRIDGE INVENTORIES ACROSS IWs



Table APX5-1 Bridges (including Locks with Bridges) across Inland Waterway (Cairo-Alex IW)

IW	Stretch	No.	Bridges and Locks	Distance (km)	Navigation Span	Air clearance (m)
Cairo/Alexandria	Beheiry Canal (0-82 km)	1	Beheiry canal lock bridge	0	1 navigation span, 25 m width	5.65
		2	Nakla bridge (roads)	6	1 navigation span, 25 m width	8.45
		3	Nakla ring bridge (pedestrians)	6.45	1 navigation span, 25 m width	Movable
		4	Khataatba bridge	40.6	1 navigation span, 29 m width	7.1
		5	Katatba new lock	42.5	1 navigation span, 16 m width and 116 m length	-
		6	Akhmas bridge	45.5	1 navigation span, 29 m width	6.45
		7	Kafr Dawood bridge (pedestrian)	52.2	1 navigation span, 29 m width	6.45
		8	Kafr Dawood bridge (road)	52.5	1 navigation span, 29 m width	6.6
		9	Tayrya bridge (road)	73.5	1 navigation span, 32 m width	7.4
		10	Head of Nubaria lock bridge	82	1 navigation span, 16 m width	7.75
		11	Head of Nubaria lock	82.5	1 navigation span, 16 m width and 116 m length	-
	Noubaria Canal (0- 119.25 km)	1	Manashy railway immovable bridge	2	2 navigation spans, 18 m width each	5.9
		2	Khenaza bridge (road)	6.25	1 navigation span, 32 m width	6.3
		3	Hadeen bridge	11.35	1 navigation span, 32 m width	6.75
		4	Abd El-mageed Saleeh immovable bridge	23.9	2 navigation spans, 15.500m width each	6.45
		5	Bostan lock 28.5	28.5	1 navigation span, 16 m width and 116 m length	-
		6	Omara immovable bridge (road)	40.6	2 navigation spans, 16 m width each	16.15
		7	Abd immovable bridge (road)	45.1	2 navigation spans, 16 m width each	5.92
		8	Moudeer immovable bridge (road)	52.4	2 navigation spans, 16 m width each	6.5
		9	Janaklees lock	61	1 navigation span, 16 m width and 116 m length	-
		10	Janakelss lock bridge	61	1 navigation span, 16 m width	6.75
		11	Maritime inspection immovable bridge(road)	66	1 navigation span, 25 m width	5.25
		12	Mahdya bridge	75	1 navigation span, 25 m width	5.65
		13	Ras Teraa immovable bridge(road)	81	1 navigation span, 25 m width	5.85
14	Sharbaat bridge	90	1 navigation span, 24 m width	6		
15	Nahda lock km 100	100	1 navigation span, 16 m width and 116 m length	-		
16	Nahda lock bridge	100.12	1 navigation span, 16 m width	6.7		
17	Desert road bridge	113	1 navigation span, 25 m width	5.9		
18	International road bridge (coastal)	117	1 navigation span, 35 m width	8.3		
19	Matrouh railway bridge	118.6	2 navigation spans, 18 m width each	5.4		
20	Aman bridge	118.35	2 navigation spans, 16 m width each	5.3		
21	Max immovable bridge (road)	119.25	2 navigation spans, 17 m width each	5.3		
22	Big briny lock	119.25	1 navigation span, 16 m width and 116 m length	-		
23	Railway inside port bridge	119.45	1 navigation span, 16 m width	6		
24	Small briny lock	119.5	1 navigation span, 16 m width and 116 m length	-		

Source: RTA

Table APX5-2 Bridges (including Locks with Bridges) across Inland Waterway (Cairo-Alex IW)

IW	Stretch	No.	Bridges and Locks	Distance (km)	Navigation Span	Air clearance (m)
Cairo/Damietta	Damietta Branch	1	Qanater El-Khayria bridge	0	1 navigation span, 12 m width	Movable
		2	Delta Barrage lock bridge	0.27	1 navigation span, 12 m width	Movable
		3	Delta Barrage New lock	0.475	1 navigation span, 17 m width and 120 m length	-
		4	Darawa railway bridge	2.8	2 navigation spans, 28 m each	Movable
		5	Banha railway bridge	53.8	2 navigation spans, 22 m each	Movable
		6	Banha road bridge	54.2	2 navigation spans, 19.75 m each	Movable
		7	Banha upper road bridge	55.7	1 navigation span, 115 m width	12
		8	Zefta railway and road bridge	90.9	2 navigation spans, 25 m each	Movable
		9	Meet Ghamr bridge	93	1 navigation span, 84 m width	10.6
		10	Zefta Barrage new lock	94	1 navigation span, 17 m width and 120 m length	-
		11	Samalout movable road bridge	127.5	2 navigation spans, 20 m each	Movable
		12	Mansoura university immovable bridge	143.1	1 navigation span, 84 m width	10.85
		13	Talkha/Mansoura road bridge	146.1	2 navigation spans, 20 m each	Movable
		14	Talkha/Mansoura railway bridge	146.9	2 navigation spans, 26 m each	Movable
		15	Sherbeen immovable road bridge	172.2	1 navigation span, 75 m width	11.43
		16	Sherbeen old road bridge	173	2 navigation spans, 18 m each	Movable
		17	Faraskour immovable road bridge	211.5	1 navigation span, 60 m width	10.95
		18	Kafr Bostan immovable bridge	222.1	2 navigation spans, 65 m each	13
		19	Damietta lock (Dam lock)	228.6	1 navigation span, 17 m width and 150 m length	-
		20	Damietta new steel bridge	231.5	2 navigation spans, 33 m each	Movable
		21	Damietta new immovable bridge	232.3	1 navigation span, 42 m width	7.95
		22	Head of Sananya immovable road bridge	236.4	1 navigation span, 35 m width	7.95
		23	Damietta port immovable road bridge	237.4	1 navigation span, 42 m width	7.98
		24	End of waterway (Mediterranean sea)	241		

Source: RTA

Table APX5-3 Bridges (including Locks with Bridges) across Inland Waterway (Cairo-Alex IW)

IW	Stretch	No.	Bridges and Locks	Distance (km)	Navigation Span	Air clearance (m)
Cairo/Ismailia	Ismailia Canal	1	Head of Ismailia canal lock (Mazalat)	Zero	1 navigation span (160 x 16)	-
		2	Mazalat old road bridge	0.16	1 navigation span, 40 m width	7.2
		3	Mazalat new road bridge	0.3	1 navigation span, 32 m width	8.2
		4	Aboud steel road bridge	1.1	1 navigation span, 30 m width	7.3
		5	Aboud movable railway bridge	1.15	1 navigation span, 30 m width	Movable
		6	Temporary pedestrian bridge	2.95	Complete opening	Movable
		7	Under construction bridge	3	2 navigation spans, 10 m width each	Movable
		8	Sawah (Amirya) bridge	4	1 navigation span, 30 m width	6.2
		9	Temporary pedestrian bridge	4.7	Complete opening	Movable
		10	Delta pedestrian bridge	4.75	2 navigation spans, 12.5 m width each	Movable
		11	Mustorod road bridge	6.2	1 navigation span, 40 m width	7.9
		12	Mustorod pedestrian bridge	7.4	2 navigation spans, 12m width each	Movable
		13	Khosous road bridge	10	1 navigation span, 30 m width	6.2
		14	Saryaqos lock	12.96	1 navigation span (143 x 17)	-
		15	Saryaqos road bridge	13.65	1 navigation span, 24 m width	6.9
		16	Kafr Hamza steel bridge	18	1 navigation span, 28 m width	6
		17	Abou Zabal steel bridge	21.3	2 navigation spans, 10 m width each	Movable
		18	Abou Zabal railway bridge	22.1	1 navigation span, 30 m width	Movable (5 m)
		19	Mounier lock	28	1 navigation span (110 x 17)	-
		20	Mounier lock bridge	28.12	1 navigation span, 17 m width	6.5
		21	Air forces steel pedestrian bridge	33	2 navigation spans, 12 m width each	Movable
		22	Zawaml road bridge	35.3	1 navigation span, 24 m width	6.64
		23	Anshas steel bridge	37.4	1 navigation span, 24 m width	Movable
		24	Geta steel bridge	43.6	1 navigation span, 25 m width	5
		25	Dar El-Salam steel bridge	44.5	1 navigation span, 28 m width	6.75
		26	Adlya pedestrian bridge	49	2 navigation spans, 12 m width each	Movable
		27	Belbees road bridge	51	1 navigation span, 24 m width	4.8
		28	Belbees pedestrian bridge	51.2	2 navigation spans, 12 m width each	Movable
		29	Cairo – Zagazeg road bridge	52	1 navigation span, 30 m width	7.15
		30	Shabab bridge	63	2 navigation spans, 12 m width each	Movable
		31	Wasef pedestrian bridge	67	2 navigation spans, 12 m width each	Movable
		32	Fol bridge, Wadi Malak	70.5	1 navigation span, 28.50 m width	7
		33	Abbasya road bridge	72	1 navigation span, 25.75 m width	7
		34	Kafr Abu Negm pedestrian bridge	74	1 navigation span, 28.50 m width	6.5
		35	Salyhia lock and road bridge	77	1 navigation span (116 x 16)	6
		36	Zahyria pedestrian bridge, Tal El-Kebeer	78	1 navigation span, 28.50 m width	6
		37	Zahyria steel road bridge, Tal El-Kebeer	81	2 navigation spans, 12.25 m width each	Movable
		38	Abu Ashour pedestrian bridge	84.5	1 navigation span, 28.50 m width	8
		39	Abu Abada pedestrian bridge	86.8	1 navigation span, 28.50 m width	8
		40	Balawa pedestrian bridge	88.4	1 navigation span, 28.50 m width	8
		41	Balawa steel road bridge	89.8	2 navigation spans, 12.25 m width each	Movable
		42	Oasaseen steel road bridge	96.3	2 navigation spans, 12.25 m width each	Movable
		43	Oasaseen upper road bridge	96.3	1 navigation span, 28.50 m width	9
		44	Pedestrian	101.5	Can be joined to land	-
		45	Mahsama station pedestrian bridge	104.3	1 navigation span, 28.50 m width	8
		46	Mahsama steel road bridge	106.7	2 navigation spans, 12.25 m width each	Movable
		47	Abal pedestrian bridge, old Mahsama	107.4	1 navigation span, 28.50 m width	6
		48	Abu Shamyia pedestrian bridge	110.9	1 navigation span, 28.50 m width	6
		49	Abou Souer steel road bridge	114.8	2 navigation spans, 12.25 m width each	Movable
		50	Abu Sultan pedestrian bridge	117.2	1 navigation span, 28.50 m width	6
		51	Shuaib steel road bridge	119.2	2 navigation spans, 12.25 m width each	Movable
		52	Cairo / Port Said road bridge	122.5	1 navigation span, 28.50 m width	6
		53	Pedestrian bridge crossing	129	Can be joined to land	-
		54	Cairo / Suez bridge (Nafesha)	130.2	1 navigation span, 28.50 m width	7
		55	Nafesha pedestrian bridge	131.2	1 navigation span, 8.5 m width	Movable
		56	Nafesha steel railway bridge	132	1 navigation span, 12.80 m width	Movable
		57	Galaa steel movable road bridge	135	1 navigation span, 12.80 m width	3
		58	Rai pedestrian bridge	139.1	1 navigation span, 8.5 m width	Movable
		59	Balagat road bridge	140.6	1 navigation span, 12.80 m width	Movable

Source: RTA

Table APX5-4 Bridges (including Locks with Bridges) across Inland Waterway (Cairo-Alex IW)

IW	Stretch	No.	Bridges and Locks	Distance (km)	Navigation Span	Air clearance (m)
Cairo/Aswan	Nile Mainstream	1	Aswan new bridge	7	Nile river width	13
		2	Edfu bridge	116	3 navigation span, 50 m width	13
		3	Luxur bridge	214	90 m	13
		4	Kena bridge	290	3 navigation span, 50 m width	13
		5	Kena railway bridge	292	5 navigation span, 80 m width	13
		6	Naga Hammadi railway bridge	340	2 navigation span, 38 m width	Movable
		7	Naga Hammadi road bridge	340.5	2 navigation span, 38 m width	Movable
		8	Sohag bridge	425	3 navigation span, 40 m width	13
		9	Asyut bridge	545	3 navigation span, 45 m width	13
		10	El Minia bridge	700	2 navigation span, 50 m width	13
		11	Bany Swif bridge	823	3 navigation span, 47 m width	13
		12	El Marazik railway bridge	924.5	1 navigation span, 85 m width	13
		13	El Monib bridge	951	2 navigation span, 150 m width	13
		14	El Giza bridge	954	1 navigation span, 110 m width	11
		15	El Gamaa bridge	955	1 navigation span, 110 m width	10
		16	El Tahrir bridge	957	2 navigation span, 50 m width	4.5 (Movable)
		17	6th October bridge	958	1 navigation span, 55 m width	10
		18	15th May bridge	959	1 navigation span, 45 m width each	10
		19	Imbaba railway bridge	960	2 navigation span, 21 m width	4.45
		20	El Farag roard bridge	962	1 navigation span, 110 m width	10
		21	El Warak	964	1 navigation span, 45 m width	n.a.

Source: 2003 JICA Study Report

## APPENDIX-6

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### AMENDMENT OF PRESIDENTIAL DECREE

No. 474 (1979)

Decision of the President of the Republic

No. 117 of 2008

To amend certain provisions of Presidential  
Decree

No. 474 of 1979 establishing the Public  
Authority for river transportation

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After reviewing the Constitution

And Law No. 10 of 1956 regarding the inland  
navigation

Law No. 130 of 1957 concerning the organization  
of anchors and anchor in inland waters

And the law of public bodies issued by Law No. 61  
of 1963

And Presidential Decree No. 474 of 1979 to create  
the Authority of River Transport

And Presidential Decree No. 57 of 2002, with the  
Ministry of Transport, and the approval of the  
Minister

# *Decide*

## *Article I*

Replaces the texts of articles 3 and 5 of Presidential Decree No. 474 of 1979 Referred to Bringing the texts:-

Article 3:- Authority to proceed with the terms of reference that would ensure the purpose for which it was established, and has especially the following:-

- 1 - Implementation of the provisions of the laws on the Organization of inland navigation.
- 2 - Development of comprehensive planning for the facility of river transport, all industrial business related to it and make the necessary adjustments to meet the requirements of development in all areas and the adoption of programs and projects, wedding and supervision of implementation, after consulting the Ministry of Defense and taking into account the decisions of the conditions and rules required by the Defense Affairs of the State
- 3 - Technical specifications, conditions and regulations for inland navigation and specific costs Preview river ports and river units and machine required in operation to ensure the commitment of all the people involved to ensure the safety and efficiency of operation and would maintain the safety of water and waterways and make this decision of the Minister of Transport with the Ministry of Defense the specification And conditions of ports .
- 4 - Cleansing and waterways development and maintenance of locks and in order to achieve good use of them as best as possible after the approval of the Ministry of Water Resources and Irrigation .
- 5 - Supervision of all projects, river transport to ensure the safety of the implementation and compliance with the conditions and technical specifications.

6 - Specify fonts and navigational locks and marinas, and establish rules for use, and in coordination with the Ministry of Water Resources and Irrigation.

7 - Development of industrial installations and usage fees that are set up.

8 - Division of navigable waterways to the lines to transport passengers and cargo, conduct, in accordance with the regulations and rules set out the laws of inland navigation.

9 - Issuance of licenses in the work of transporting passengers and goods and equipment and materials of all types, containers and determine their return.

And exempt the Ministry of Defense to obtain such licenses.

10 - The establishment of companies individually after the approval of the Minister of Transport, or with other partners, after consulting the Ministry of Defense and the approval of the Minister of Transport, after approval of the Cabinet in all cases, to create, manage and maintain and exploit the river ports on the Nile River and navigational channels and do any work that intervention in the scope of Its purpose.

Article 5:- The Board of Directors chaired by the Chairman of the Board and the membership of the

Head of the relevant advisory opinion of the State Council

Representative of the Ministry of Defense chosen by the Minister of Defense

Representative of the Ministry of the Interior by the Chairman of the Interior

Representative of the Ministry of Water Resources and Irrigation chosen by the Minister of Water Resources and Irrigation

Representative chosen by the Ministry of the Environment and Minister of the Environment

Representative of the Secretariat of the local development chosen by the minister concerned



Four of the issues experienced by choosing a decision of the Minister of Transport for two years

## *Article II*

Insert a new article 3 - the Presidential Decree No. 474 of 1979, referred to shall read as follows

Article 3:- may not create or establish or Administration or operation of ports or berths on the River Nile and navigation channels for the circulation of goods and equipment and materials of all kinds And containers without obtaining a permit from the Authority and in accordance with the rules and conditions And specifications to be determined by, and after obtaining the prior approval of the Ministry of Defense and Ministry of Water Resources And irrigation for locations Ports.

## *Article III*

This decision is published in the Official Gazette and shall take effect from the day following the date of publication.

## **APPENDIX-7**

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### **RULES FOR OBTAINING SERVICE LICENSES**

## **Rules for obtaining the service**

### **A first time navigation license request for automatic river units**

According to Cabinet Decree no. 4248 for 1998 to facilitate procedures for citizens to obtain public services including a first time navigation license request for automatic river units from the Ministry of transport, River Transport Authority, the administrative authorities shall provide the service as mentioned herein. This form is the outcome of the cooperation between the Ministry of State for Administrative Development and Ministry of Transport (River Transport Authority) specifying the documents, papers, and money required to obtain the service, as well as the timeframe to achieve it or stating its opinion on the request. Any violation thereof shall subject to liability as follows:

#### **First: required documents and papers:**

##### **These documents should be attached:**

1. Initial approval from the authority on (construction / import).
2. 3 copies (original + 2 duplicate) of detailed engineering designs of the units and rescue boats approved by the consulting authority and stated in the registration administration in the authority.
3. Copy of the owner's contract with the manufacturing workshop.

##### **For tourist units the following documents shall be added:**

- A. Copy of company establishment contract.
- B. Initial approval from the Ministry of Tourism.

Before issuing the license and after verifying the technical suitability of the unit and its operating machines, the following documents shall be fulfilled:

1. Unit title deed, purchase contract, or a notarized certificate of origin from the manufacturing workshop after estimating its value in the authority. If the unit or any of its parts is imported, endorsed customs clearance shall be provided.
2. Copy of valid navigation licenses of the crew.
3. Insurance certificate of the crew and owners.
4. Title deeds of rescue boats (notarized/ custom clearance) specified according to cargo.
5. Seaworthiness certificate of tourist boats, ferries, and liquid cargo boats. Seaworthiness certificate approved by the authority for passenger boats having more than 30 passengers on board.
6. Insurance policy for passenger units.
7. Copy of Tax Card provided with the activity, number, and name of the unit; Private picnic units are exempted.
8. Certificate from the competent authority to install (sanitation tanker) in units that have lavatories.
9. A proof for paying the fees and practical and engineering stamps.
10. Fire insurance certificate from civil defense.

##### **For tourist units the following documents shall be added:**

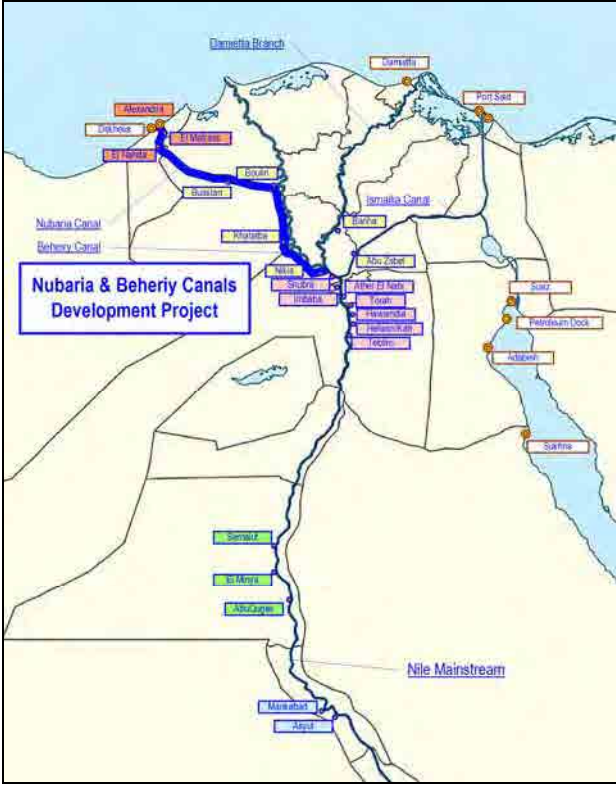

- A. Copy of Ministry of Agriculture and Irrigation approval to allocate berth for tourist units.
- B. Proof of radar and wireless installation.
- C. A certificate from the designer or modifying Engineering Consulting Bureau and the international supervisory authority approving it that indicate the supervision on construction or modification in all stages.

# APPENDIX-8



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## IWT PROJECT SHEETS

# Transportation Project Sheet (IWT-1)



Internal Code (to be given by the Study Team)	Prepares by:  Date: / / 2010
Original Code: <b>1055</b> (if any given by the Organization in charge)  Project Title : <u>Nubaria and Beheiry canals development project</u>  <u>(Cairo-Alexandria navigation route)</u>	Transport Mode  Road <input checked="" type="checkbox"/> IWT  Rail <input type="checkbox"/> Pipeline  Port <input type="checkbox"/> Others
Project Description:  <u>Protecting the bridges of Nubaria and Beheiry canals.</u>  <u>Identifying the location of alluvial deposits and bridges collapse, and performing the necessary purification to reach design levels.</u>  <u>Renew, modernize, and maintain locks regularly, construct an extension to the small briny lock, and construction of a new lock at 100 KM on Nubaria canal.</u>	
Organization in charge: <b>River Transport Authority (RTA)</b>	Progress of the Project  <input checked="" type="checkbox"/> 1 Under Construction 2 Bidding/Constructing  3 Financed/Budget Allotted  4 D/D Completed  5 F/S Completed  6 Project Idea Stage
Planned Implementation Period: <b>2007 to 2012</b>	
Information Source: <b>Central Administration for Technical Affairs</b>	
Cost: (million LE): <b>714.5</b> Estimated in: <b>2006</b>	
Route/Location Map   	

# Transportation Project Sheet (IWT-2)

Internal Code (to be given by the Study Team)	Prepares by:  Date: / / 2010
Original Code: <b>1057</b> (if any given by the Organization in charge)  Project Title : <u>Development of Cairo-Aswan waterway</u>	Transport Mode  Road <input checked="" type="checkbox"/> IWT  Rail <input type="checkbox"/> Pipeline  Port <input type="checkbox"/> Others
Project Description :  <u>Development and purification of the navigation route in the Nile from Cairo to Aswan and removing navigation bottlenecks to protect river units and cargo and passenger transport.</u>  <u>Specifying the navigation route by buoys and adding signs with night lights</u>  <u>Producing navigation maps through regular cadastral survey and removing any navigation bottlenecks considering the variable nature of the Nile</u>	
Organization in charge: <b>River Transport Authority (RTA)</b>	Progress of the Project  <input checked="" type="checkbox"/> 1 Under Construction  2 Bidding/Constructing  3 Financed/Budget Allotted  4 D/D Completed  5 F/S Completed  6 Project Idea Stage
Planned Implementation Period: <b>2007 to 2012</b>	
Information Source: <b>Central Administration for Technical Affairs</b>	
Cost: (million LE): <b>101.51</b> Estimated in: <b>2006</b>	
Route/Location Map  	Egypt  



## Transportation Project Sheet (IWT-4)

Internal Code (to be given by the Study Team)	Prepares by:  Date: / / 2010
Original Code: <b>3060</b> (if any given by the Organization in charge)  Project Title : <u>Establishment of central control and surveillance network</u> <u>(River Information System)</u>	Transport Mode  Road <input checked="" type="checkbox"/> IWT Rail <input type="checkbox"/> Pipeline Port <input type="checkbox"/> Others
Project Description:  <u>Establish a central control and surveillance network to control and organize the navigation, provide the appropriate service to different river units, and avoid units' congestion in front of locks. This can be achieved by:</u> <ul style="list-style-type: none"> <li><u>Preparation for the establishment of infrastructure for Nile information network.</u></li> <li><u>Establishment of internal computer surveillance network for the authority.</u></li> </ul>	
Organization in charge: <b>River Transport Authority (RTA)</b>	Progress of the Project  <input checked="" type="checkbox"/> 1 Under Construction 2 Bidding/Constructing  3 Financed/Budget Allotted  4 D/D Completed  5 F/S Completed  6 Project Idea Stage
Planned Implementation Period: <b>2007 to 2012</b>	
Information Source: <b>Central Administration for Technical Affairs</b>	
Cost: (million LE): <b>0.5</b> Estimated in: <b>2006</b>	
Route/Location Map  	Egypt  



## APPENDIX-9

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### IWT CARGO TRAFFIC VOLUMES FORECAST (2027)

Table APX9-1 IWT Forecast Cargo Volume by Route (All Commodities) in 2027 (tonne/day)

ROUTE 1: CAIRO-ASWAN				Direction 1			Direction 2			Both Directions		
SEQ	N	LZ	PORT	Incoming	Outgoing	VOL	Incoming	Outgoing	VOL	Incoming	Outgoing	VOL
1	42020	1	Ather El Nabi	13,613.85		13,613.85				13,613.85	8,019.71	21,633.56
2	42051	1	Torah	35.9	318.44	13,331.31	268.69	29.67	8,019.71	304.59	348.11	21,112.00
3	42052	6	Hawamdia	0.42	24.17	13,307.56	2.66	10.63	7,780.69	3.08	34.80	21,096.22
4	42053	6	Helwan/Kafr	4.25	180.73	13,131.08	78.6	21.6	7,788.66	82.85	202.33	20,862.74
5	42055	7	El Shobk ( Limestone)	0.03	103	13,028.11	79.69	0.15	7,731.66	79.72	103.15	20,680.23
6	42056	7	Tebbin	31.96	128.87	12,931.20	82.78	47.67	7,652.12	114.74	176.54	20,548.21
7	42026	34	Samalut	23.81	49.49	12,905.52	32.12	19.81	7,617.01	55.93	69.30	20,510.22
8	42057	34	El Minya	18.42	57.62	12,866.32	39.12	14.27	7,604.70	57.54	71.89	20,446.17
9	42058	34	Abu Qurgas	3.27	0.49	12,869.10	1.12	2.55	7,579.85	4.39	3.04	20,450.38
10	42059	36	Mankabad	6.45	169.66	12,705.89	88.46	7.56	7,581.28	94.91	177.22	20,206.27
11	42060	36	Asyut	78.13	1,858.17	10,925.85	981.67	79.45	7,500.38	1,059.80	1,937.62	17,524.01
12	42061	38	Sohag	106.89	1,259.43	9,773.31	882.89	79.47	6,598.16	989.78	1,338.90	15,568.05
13	42062	38	Girga	49.5	598.41	9,224.40	409.49	36.69	5,794.74	458.99	635.10	14,646.34
14	42063	41	Nag Hammadi	109.23	1,819.42	7,514.21	1,036.04	159.35	5,421.94	1,145.27	1,978.77	12,059.46
15	42071	39	Dishna	43.68	1,189.64	6,368.25	565.29	105.47	4,545.25	608.97	1,295.11	10,453.68
16	42033	39	Gena	302.58	3,135.04	3,535.79	1,501.73	312.3	4,085.43	1,804.31	3,447.34	6,431.79
17	42064	40	Qus	3.18	230.83	3,308.14	441.78	0.08	2,896.00	444.96	230.91	5,762.44
18	42065	42	Luxor	1.53	1,320.45	1,989.22	633.76	0.58	2,454.30	635.29	1,321.03	3,810.34
19	42066	43	Armant	0.16	557.04	1,432.34	274.49	0.06	1,821.12	274.65	557.10	2,979.03
20	42067	45	El-Sibaya	0.08	657.56	774.86	652.1		1,546.69	652.18	657.56	1,669.45
21	42068	44	Edfu		353.28	421.58	438.64		894.59	438.64	353.28	877.53
22	42070	44	Aswan		32.9	388.68	294.53		455.95	294.53	32.90	550.10
23	42073	44	El Sad El-Ali (Wadi El-Nile)		308.12	80.56	112.11		161.42	112.11	308.12	129.87
24	42038	44	Wadi Halfa		80.56		49.31		49.31	49.31	80.56	0.00

ROUTE 2: CAIRO-ALEX				Direction 1			Direction 2			Both Directions		
SEQ	N	LZ	PORT	Incoming	Outgoing	VOL	Incoming	Outgoing	VOL	Incoming	Outgoing	VOL
1	42020	1	Ather El Nabi	1,999.44		1,999.44				1,999.44	3,289.92	5,289.35
2	42049	3	Shubra (Sulpher)	120.42	44.16	2,075.70	70.53	86.83	3,289.91	190.95	130.99	5,381.91
3	42048	3	Shobra El-Khema (Clay)	14.01	37.32	2,052.39	34.9	10.76	3,306.21	48.91	48.08	5,334.46
4	42046	8	Embaba	4.7	92.58	1,964.51	60.68	11.19	3,282.07	65.38	103.77	5,197.09
5	42019	23	Nikla	0.03	9.39	1,955.15	4.78	0.06	3,232.58	4.81	9.45	5,183.01
6	42054	23	khatatba	0.57	0.1	1,955.62	13.73	0.28	3,227.86	14.30	0.38	5,170.03
7	42016	27	Boulin		45.97	1,909.65	49.87		3,214.41	49.87	45.97	5,074.19
8	42017	27	Busstan	0.64	33.24	1,877.05	51.18	0.39	3,164.54	51.82	33.63	4,990.80
9	42015	29	El Nahda	1.29	86.29	1,792.05	376.75	0.66	3,113.75	378.04	86.95	4,529.71
10	42014	29	El Metrass	10.75	58.49	1,744.31	1,539.07	1.35	2,737.66	1,549.82	59.84	2,944.25
11	42013	29	Alexandria		1,744.32		1,199.94		1,199.94	1,199.94	1,744.32	0.00

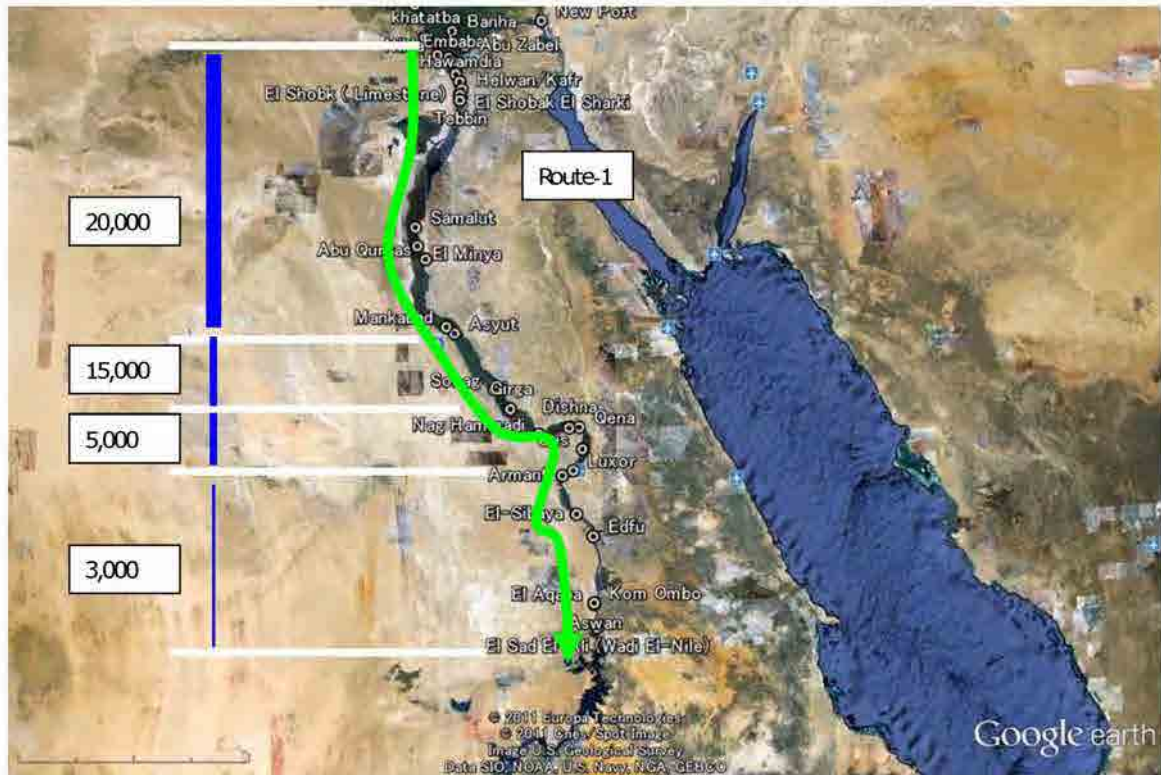
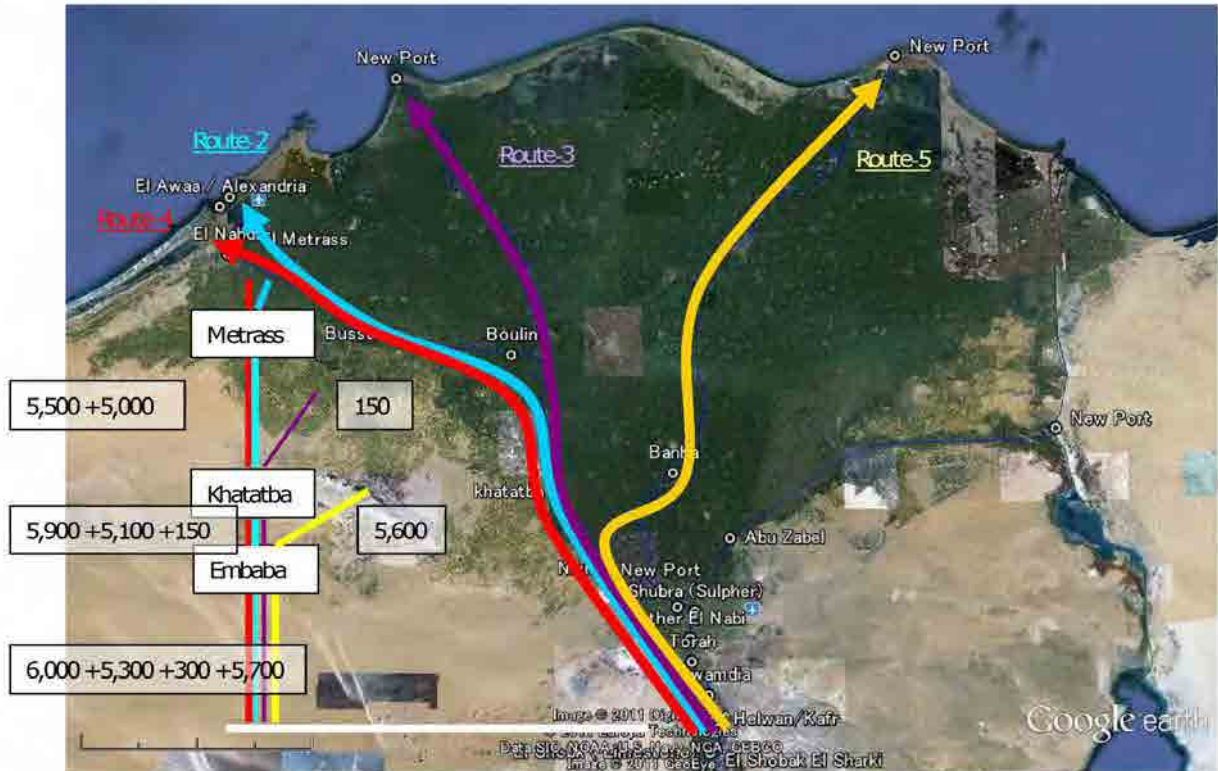
ROUTE 3: CAIRO-BEHEIRA				Direction 1			Direction 2			Both Directions		
SEQ	N	LZ	PORT	Incoming	Outgoing	VOL	Incoming	Outgoing	VOL	Incoming	Outgoing	VOL
1	42020	1	Ather El Nabi	104.16		104.16				104.16	175.38	279.53
2	42049	3	Shubra (Sulpher)	118.8	44.16	178.8	70.53	80.54	175.37	189.33	124.70	364.18
3	42048	3	Shobra El-Khema (Clay)	14.01	37.32	155.49	34.9	10.75	185.38	48.91	48.07	316.72
4	42046	8	Embaba	1.73	92.58	84.64	60.68	1.76	161.23	62.41	94.34	166.95
5	42019	23	Nikla	0.05	9.39	55.3	4.78	0.05	102.31	4.83	9.44	152.88
6	42054	23	khatatba	0.68	0.1	55.88	13.73	0.73	97.58	14.41	0.83	140.46
7	42043	28	New Port		55.89		84.58		84.58	84.58	55.89	0.00

ROUTE 4: CAIRO-DEKHEILA				Direction 1			Direction 2			Both Directions		
SEQ	N	LZ	PORT	Incoming	Outgoing	VOL	Incoming	Outgoing	VOL	Incoming	Outgoing	VOL
1	42020	1	Ather El Nabi	1,336.50		1,336.50				1,336.50	4,740.14	6,076.62
2	42049	3	Shubra (Sulpher)	120.34	44.16	1,412.68	70.53	90.63	4,740.12	190.87	134.79	6,172.90
3	42048	3	Shobra El-Khema (Clay)	14.01	37.32	1,389.37	34.9	10.76	4,760.22	48.91	48.08	6,125.45
4	42046	8	Embaba	4.58	92.58	1,301.37	60.68	16.99	4,736.08	65.26	109.57	5,993.76
5	42019	23	Nikla	0.03	9.39	1,292.01	4.78	0.06	4,692.39	4.81	9.45	5,979.68
6	42054	23	khatatba	0.54	0.1	1,292.45	13.73	0.46	4,687.67	14.27	0.56	5,966.85
7	42016	27	Boulin		45.97	1,246.48	49.87		4,674.40	49.87	45.97	5,871.01
8	42017	27	Busstan	0.58	33.24	1,213.82	51.18	0.41	4,624.53	51.76	33.65	5,787.58
9	42015	29	El Nahda	1.28	86.29	1,128.81	376.75	0.84	4,573.76	378.03	87.13	5,326.66
10	42014	29	El Metrass	10.58	58.49	1,080.90	1,539.07	3.21	4,197.85	1,549.65	61.70	3,742.89
11	42011	29	El Awaa / Alexandria		1,080.91		2,661.99		2,661.99	2,661.99	1,080.91	0.00

ROUTE 5: CAIRO-DAMIETTA				Direction 1			Direction 2			Both Directions		
SEQ	N	LZ	PORT	Incoming	Outgoing	VOL	Incoming	Outgoing	VOL	Incoming	Outgoing	VOL
1	42020	1	Ather El Nabi	2,635.83		2,635.83				2,635.83	3,069.09	5,704.92
2	42049	3	Shubra (Sulpher)	112.56	44.16	2,704.23	70.53	77.35	3,069.09	183.09	121.51	5,780.14
3	42048	3	Shobra El-Khema (Clay)	12.72	37.32	2,679.63	34.9	9.66	3,075.91	47.62	46.98	5,730.30
4	42046	8	Embaba	27.74	92.58	2,614.79	60.68	7.24	3,050.67	88.42	99.82	5,612.02
5	42045	4	Banha		3.42	2,611.37	1.02		2,997.23	1.02	3.42	5,607.58
6	42042	16	New Port		2,611.37		2,996.21		2,996.21	2,996.21	2,611.37	0.00



Source: JICA Study Team

Unit : ton/day

Figure APX9-1 Schematic Drawing of IWT Cargo Traffic Flow Forecast (2027)

## APPENDIX-10

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### IWT CAPACITY

## ESTIMATE OF IWT CAPACITY

### 1) Methodology

IWT capacity is estimated by the following procedure:

- ✚ Separate each IW by every lock to segments
- ✚ Select maximum target barge and determine fleet loading capacity with consideration of load factor
- ✚ Estimate maximum accommodative unit numbers per day at each lock, by division of maximum daily lock operation time by required time on lock operation
- ✚ Compute traffic capacity at each lock, by multiplication of corresponded maximum accommodative unit numbers per day and maximum fleet loading capacity
- ✚ Estimate maximum accommodative unit numbers per day at each IW segment between locks, based on IW capacity
- ✚ Compute traffic capacity at each IW segment between locks, by multiplication of corresponded maximum accommodative unit numbers per day and maximum fleet loading capacity
- ✚ Select more critical traffic capacity from the both traffic capacity computed
- ✚ Compare the critical traffic capacity with future traffic forecast in 2027 (refer to APPENDIX-9)

### 2) Prerequisites

In order to estimate each traffic capacity of lock and IW, the following prerequisites are applied upon its computation:

#### a) Lock Capacity

Lock capacity is estimated based on maximum operational hour per day resulted in 2003 JICA Study report (same operational hour per day of Cairo-Alex was applied to locks in Cairo-Aswan IW) as referred to TableAPX10-1.

TableAPX10-1 Capacities of Lock

IW	Cairo/Alex IW	Cairo/Damietta
Longest Cycle Time	0.75 hrs	0.67 hrs
Lock Capacity	32 twin-units per day	36 twin-units per day

Note: Cycletime includes open/close times of gates, water-filling/discharging time and enter/leave times of twin-units assumed with 12 meters beam as a new-type barges

Source: 2003 JICA Study Report

#### b) IW Capacity

IW capacity is estimated based on minimum traffic volume in consideration of actual waterway section (semi-two way passing: when a barge passes one lane with speed limit, another barge stops on the other lane) as examined in 2003 JICA Study report (the capacity for Cairo-Aswan IW was assumed as non-restricted passing condition) as referred to Table APX10-2.

TableAPX10-2 Capacities of IWs

IW	Cairo/Alex IW	Cairo/Damietta
Operation Type	Semi-Two-Way	Semi/Full-Two-Way
IW Capacity	210 units per day	160 units per day

Source: 2003 JICA Study Report

c) Maintenance of Infrastructures

All the infrastructures, such as lock, IW, fleet, navigation aids and other relevant facilities are well-maintained by RTA and other relevant parties.

d) River Information Services (RIS)

RIS is fully installed and well-organized to all the IWs and well functions without any problems.

e) Fleet Dimensions

For comparison between twin-combo type and single large-sized barge systems, the following units are applied into the estimate:

2 x 50 meters long standard-sized barge (loading capacity is 420 tons per barge sourced from 2003 JICA Study report)

1 x 100 meters long large-sized barge (loading capacity is 1,430 tons per barge sourced from 2003 JICA Study report)

f) Load Factor

Considering non-full loading conditions of barge transport due to adjustment of barge draft for shallow depth along IWs, load factor of 70 % applies to computation of fleet loading capacity.

g) Lock Operation Time

12 and 24 hours lock operations are considered into the estimate.

h) Night Navigation

In case of 24 hours lock operation, all barge transports are able to navigate at night time.

i) Others

No new development, improvement and change of waterways and locks are considered into the estimate.

### 3) Case

The following 4 cases apply to the estimate:

Case 1-1: 2 x 50 meters barges, 12 hours lock operation at day time only

Case 1-2: 2 x 50 meters barges, 24 hours lock operation at day and night times

Case 2-1: 1 x 100 meters barge, 12 hours lock operation at day time only

Case 2-2: 1 x 100 meters barge, 24 hours lock operation at day and night times

#### 4) Results of Estimated IWT Capacities

Tables APX10-3, -4, -5 and -6 describe the results of the estimated IWT capacities for each case. The shown highlighted in pink color is out of capacity at the lock and/or IW for the corresponded future traffic forecast by NaTM.

#### 5) Conclusions

The following are conclusions based on the results as shown in 4).

- ✚ Lock capacity is more critical than IW capacity
- ✚ Especially, Cairo-Alex and Cairo-Aswan IWTs need improvements significantly of either 24-hours operation (inland waterway, lock and other related) or fleet modernization (1 transport unit should be upgraded from 2 x 50 meters standard-sized barges to 1 x 100 meters large-sized barge).
- ✚ With the above both improvements, Asyut Barrage Lock requires expansion to the existing facilities in consideration of the future IWT traffic forecast in 2027



Table APX10-3 Estimated ITW Capacity (Case 1-1: 2 x 50 meters barges, 12 hours lock operation)

**Estimated IWT Capacities (2-50m barges, 12hrs operation)**

**Approach:** Lock capacity is estimated based on maximum operational hour per day resulted in 2003 JICA Study report (same operational hour per day of Cairo-Alex was applied to locks in Cairo-Aswan IW). IW capacity is estimated based on minimum traffic volume in consideration of actual waterway section (semi-two way passing, when a barge passes one lane with speed limit, another barge stops on the other lane) as examined in 2003 JICA Study report (the capacity for Cairo-Aswan IW was assumed as non-restricted passing condition)

- Prerequisite:**
1. All locks operate in 12 hours.
  2. IWs, locks, other facilities and fleets are well-maintained periodically by RTA or relevant sectors.
  3. RIS is fully installed and functions at all the IWs.
  3. 2-50m standard-sized barges (420 tonnage loading capacity) are operated and the actual capacity considers 70% load factor.
  - 5 No new development, improvement and change of waterways and locks are considered.

IW	Lock (route)	Distance (km)	Max. Operating Time (hr/day)	Max. Barge Speed (km/hr)	Required Time on Operation/Navigation		Dead Weight Tonnage (DWT) (ton/barge)	Fleet Loading Capacity			Lock		Inland Waterway (IW)		Forecast Traffic by NMTM (2027) (ton/day)	
					Lock (hr/unit)	IW (hr/traffic)		Load Factor	Unit Type (Twin-Combo)	Corrected Capacity (ton/unit)	[10]=[9]X[10] (unit/day)	[11]=[9]X[10] (ton/day)	[12] (unit/day)	[13]=[9]X[12] (ton/day)		
Cairo-Alex	(Ather El Nabi - Entrance Lock)	29	12	8	-	-	420	0.7	2	588	-	-	-	-	11,600	
	Entrance Lock	42	12	8	0.75	5.3	420	0.7	2	588	16	9,408	43	25,548	11,150	
	Khadaba Lock	40	12	8	0.75	5.0	420	0.7	2	588	16	9,408	41	24,331		
	Boulin Lock	28.5	12	8	0.75	3.6	420	0.7	2	588	16	9,408	29	17,336		
	Bustan Lock	33.5	12	8	0.75	4.2	420	0.7	2	588	16	9,408	35	20,377	10,960	
	Jenakless Lock	39	12	8	0.75	4.9	420	0.7	2	588	16	9,408	40	23,723		
	El Nahda Lock	20	12	8	0.75	2.5	420	0.7	2	588	16	9,408	21	12,166		
	Ena Lock	203	12	8	0.75	30.6	420	0.7	2	588	16	9,408	210	123,480		
	Sub-Total															
	Cairo-Damietta	(Ather El Nabi - New Delta Barrage Lock)	29	12	15	0.67	-	420	0.7	2	588	-	-	-	-	5,700
New Delta Barrage Lock		89	12	15	0.67	5.9	420	0.7	2	588	18	10,531	59	34,743		
Zelta Barrage Lock		134	12	15	0.67	8.9	420	0.7	2	588	18	10,531	89	52,310	5,600	
Damietta Lock		18	12	15	0.67	1.2	420	0.7	2	588	18	10,531	12	7,027		
Damietta Port		241	12	15	0.67	18.7	420	0.7	2	588	18	10,531	160	94,080		
Sub-Total																
Cairo-Aswan	(Ather El Nabi - Asyut Barrage Lock)	380	12	15	0.75	25.3	420	0.7	2	588	-	-	-	-	20,000	
	Asyut Barrage Lock	183.5	12	15	0.75	12.2	420	0.7	2	588	16	9,408	253	148,960		
	New Naji Hamadi Barrage Lock	3.5	12	15	0.75	0.2	420	0.7	2	588	16	9,408	122	71,932		
	Old Naji Hamadi Barrage Lock	189	12	15	0.75	12.6	420	0.7	2	588	16	9,408	2	1,372	15,000	
	New Esna Barrage Lock	170	12	15	0.75	11.3	420	0.7	2	588	16	9,408	126	74,088	5,000	
Aswan Dam	926	0	15	-	64.7	420	0.7	2	588	-	-	113	66,640	3,000		
Sub-Total																
<b>Total</b>		<b>1,370</b>				<b>114.1</b>							<b>617</b>	<b>362,992</b>		

**Note:**

1. Highlighted capacities in pink color are not able to flow corresponded traffic, which may create traffic congestion.
2. Double-undefined capacity in Cairo-Aswan IW is locally out of forecast traffic. However this is not critical and accommodable resultantly, because the local traffic forecast (15,000 ton/day) is ranged within the total of the double-undefined and the half capacity estimated of the IW between Asyut and New Naji Hamadi Barrage Locks.

Table APX10-4 Estimated ITW Capacity (Case 1-2: 2 x 50 meters barges, 24 hours lock operation)

**Estimated ITW Capacities (2-50m barges 24hrs operation)**

**Approach:**

Lock capacity is estimated based on maximum operational hour per day resulted in 2003 JICA Study report (same operational hour per day of Cairo-Alex was applied to locks in Cairo-Aswan IW). IW capacity is estimated based on minimum traffic volume in consideration of actual waterway section (semi-two way passing: when a barge passes one lane with speed limit, another barge stops on the other lane) as examined in 2003 JICA Study report (the capacity for Cairo-Aswan IW was assumed as non-restricted passing condition)

**Prerequisite:**

1. All locks operate in 24 hours.
2. IWs, locks, other facilities and fleets are well-maintained periodically by RTA or relevant sectors.
3. RIS is fully installed and functions at all the IWs.
4. 2-50m standard-sized barges (420 tonnage loading capacity) are operated and the actual capacity considers 80% load factor.
5. No new development, improvement and change of waterways and locks are considered.

IW	Lock (route)	Distance (km)	Max. Operating Time (hr/day)	Max. Barge Speed (km/hr)	Required Time on Operations/Navigation		Fleet Loading Capacity			Lock		Inland Waterway (IW)		Forecast Traffic by IW (2027) (ton/day)	
					Lock (hr/unit)	IW (hr/traffic)	Dead Weight Tonnage (DWT) (ton/barge)	Load Factor	Unit Type Twin-Combo	Connected Capacity (ton/unit)	Traffic Capacity (unit/day)	Traffic Capacity (ton/day)	Traffic Capacity (unit/day)		Traffic Capacity (ton/day)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]		
Cairo-Alex	(After El Nahi - Entrance Lock)	28	24	8	-	-	2	420	0.7	2	588	-	-	11,600	
	Entrance Lock	42	24	8	0.75	5.3	2	420	0.7	2	588	32	18,816	11,150	
	Khatalla Lock	40	24	8	0.75	5.0	2	420	0.7	2	588	32	18,816		
	Boulin Lock	28.5	24	8	0.75	3.6	2	420	0.7	2	588	29	17,336		
	Bustan Lock	33.5	24	8	0.75	4.2	2	420	0.7	2	588	35	20,377	10,960	
	Jemlless Lock	39	24	8	0.75	4.9	2	420	0.7	2	588	40	23,723		
	El Nahda Lock	20	24	8	0.75	2.5	2	420	0.7	2	588	21	12,166		
	End Lock	203	24	15	0.50	30.6	2	420	0.7	2	588	210	123,480		
	Sub-Total														
	Cairo-Damietta	(After El Nahi - New Delta Barrage Lock)	29	12	15	-	-	2	420	0.7	2	588	-	-	5,700
New Delta Barrage Lock		89	24	15	0.50	5.9	2	420	0.7	2	588	48	28,224		
Zelta Barrage Lock		134	24	15	0.50	8.9	2	420	0.7	2	588	48	28,224		
Damietta Lock		18	24	15	0.50	1.2	2	420	0.7	2	588	48	28,224	5,600	
Damietta Port		241	24	15	0.50	18.1	2	420	0.7	2	588	48	28,224		
Sub-Total															
Cairo-Aswan	(After El Nahi - Asyut Barrage Lock)	380	-	15	-	25.3	2	420	0.7	2	588	160	94,080		
	Asyut Barrage Lock	183.5	24	15	0.75	12.2	2	420	0.7	2	588	253	148,960	20,000	
	New Nagi Hamadi Barrage Lock	3.5	24	15	0.75	0.2	2	420	0.7	2	588	122	71,932		
	Old Nagi Hamadi Barrage Lock	189	24	15	0.75	12.6	2	420	0.7	2	588	2	1,372	15,000	
	New Esna Barrage Lock	170	24	15	0.75	11.3	2	420	0.7	2	588	126	74,088	5,000	
	Aswan Dam	926	0	15	-	64.7	2	420	0.7	2	588	113	66,640	3,000	
	Sub-Total														
<b>Total</b>						<b>113.4</b>									

Note: 1. Highlighted capacities in pink color are not able to flow corresponded traffic, which may create traffic congestion.  
 2. Double-underlined capacity in Cairo-Aswan IW is locally out of forecast traffic. However this is not critical and accommodative resultantly, because the local traffic forecast (15,000 ton/day) is ranged within the total of the double-underlined and the half capacity estimated of the IW between Asyut and New Nagi Hamadi Barrage Locks.



Table APX10-5 Estimated ITW Capacity (Case 2-1: 1 x 100 meters barges, 12 hours lock operation)

**Estimated ITW Capacities (1-100m barge, 12hrs operation)**

**Approach:**

Lock capacity is estimated based on maximum operational hour per day resulted in 2003 JICA Study report (same operational hour per day of Cairo-Alex was applied to locks in Cairo-Aswan IW)  
 IW capacity is estimated based on minimum traffic volume in consideration of actual waterway section (semi-two way passing, when a barge passes one lane with speed limit, another barge stops on the other lane) as examined in 2003 JICA Study report (the capacity for Cairo-Aswan IW was assumed as non-restricted passing condition)

**Prerequisite:**

1. All locks operate in 12 hours
2. IWs, locks, other facilities and fleets are well-maintained periodically by RTA or relevant sectors
3. RIS is fully installed and functions at all the IWs
3. 1- 100m standard-sized barges (1,430 ton/barge loading capacity) are operated and the actual capacity considers 70% load factor
5. No new development, improvement and change of waterways and locks are considered

IW	Lock (route)	Distance (km)	Max. Operating Time (hr/day)	Max. Barge Speed (km/hr)	Required Time on Operation/Navigation		Fleet Loading Capacity			Lock		Inland Waterway (IW)		Forecast Traffic by NAFIL (2027) (ton/day)
					Lock (hr/unit)	IW (hr/traffic)	Dead Weight Tonnage (DWT) (ton/barge)	Load Factor	Unit Type	Corrected Capacity (ton/unit)	Traffic Capacity (unit/day)	Traffic Capacity (ton/day)	Traffic Capacity (unit/day)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	
Cairo-Alex	(Ather El Nabi - Entrance Lock)	29	12	8	-	-	1	1,430	0.7	1	1,001	-	-	11,900
	Entrance Lock	42	12	8	0.75	5.3	1	1,430	0.7	1	1,001	16	16,016	11,150
	Khatibha Lock	40	12	8	0.75	5.0	1	1,430	0.7	1	1,001	16	16,016	
	Boulin Lock	28.5	12	8	0.75	3.6	1	1,430	0.7	1	1,001	16	16,016	41,421
	Bustan Lock	33.5	12	8	0.75	4.2	1	1,430	0.7	1	1,001	16	16,016	29,512
	Jamheliess Lock	39	12	8	0.75	4.9	1	1,430	0.7	1	1,001	16	16,016	34,690
	El Nahda Lock	20	12	8	0.75	2.5	1	1,430	0.7	1	1,001	16	16,016	40,385
End Lock											16	16,016	20,710	
<b>Sub-Total</b>		<b>203</b>				<b>30.6</b>						<b>210</b>	<b>210,210</b>	
Cairo-Damietta	(Ather El Nabi - New Delta Barrage Lock)	29	12	15	-	-	1	1,430	0.7	1	1,001	-	-	5,700
	New Delta Barrage Lock	89	12	15	0.50	5.9	1	1,430	0.7	1	1,001	24	24,024	59,146
	Zafra Barrage Lock	134	12	15	0.50	8.9	1	1,430	0.7	1	1,001	24	24,024	89,052
	Damietta Lock	18	12	15	0.50	1.2	1	1,430	0.7	1	1,001	24	24,024	11,962
	Damietta Port											24	24,024	
<b>Sub-Total</b>		<b>241</b>				<b>18.1</b>						<b>160</b>	<b>160,160</b>	
Cairo-Aswan	(Ather El Nabi - Asyut Barrage Lock)	380		15	-	25.3	1	1,430	0.7	1	1,001	-	-	20,000
	Asyut Barrage Lock	183.5	12	15	0.75	12.2	1	1,430	0.7	1	1,001	16	16,016	253,587
	New Nagi Hamadi Barrage Lock	3.5	12	15	0.75	0.2	1	1,430	0.7	1	1,001	16	16,016	122,456
	Old Nagi Hamadi Barrage Lock	189	12	15	0.75	12.6	1	1,430	0.7	1	1,001	2	2,336	15,000
	New Esna Barrage Lock	170	12	15	0.75	11.3	1	1,430	0.7	1	1,001	16	16,016	126,126
Aswan Dam		0	15	-	64.7	1	1,430	0.7	1	1,001	113	113,447	5,000	
<b>Sub-Total</b>		<b>926</b>				<b>113.4</b>						<b>617</b>	<b>617,951</b>	<b>3,000</b>
<b>Total</b>		<b>1,370</b>												

Note: 1. Highlighted capacities in pink color are not able to flow corresponded traffic, which may create traffic congestion.  
 2. Double-underlined capacity in Cairo-Aswan IW is locally out of forecast traffic. However this is not critical and accommodative resultantly, because the local traffic forecast (15,000 ton/day) is ranged within the total of the double-underlined and the half capacity estimated of the IW between Asyut and New Nagi Hamadi Barrage Locks.

Table APX10-6 Estimated ITW Capacity (Case 2-2: 1 x 100 meters barges, 24 hours lock operation)

**Estimated ITW Capacities (1-100m barge\_24hrs operation)**

**Approach:** Lock capacity is estimated based on maximum operational hour per day, resulted in 2003 JICA Study report (same operational hour per day of Cairo-Alex was applied to locks in Cairo-Aswan IW)  
 Aswan IW was assumed as non-restricted passing condition, when a barge passes one lane with speed limit, another barge stops on the other lane) as examined in 2003 JICA Study report (the capacity for Cairo-

- Prerequisite:**
- All locks operate in 24 hours
  - IWs, locks, other facilities and fleets are well-maintained periodically by RTA or relevant sectors
  - RIS is fully installed and functions at all the IWs
  - 1- 100m standard-sized barges (1,430 tonnage (loading capacity)) are operated and the actual capacity considers 70% load factor
  - No new development, improvement and change of waterways and locks are considered

IW	Lock (route)	Distance (km)	Max. Operating Time (hr/day)	Max. Barge Speed (km/hr)	Required Time on Operation/Navigation		Fleet Loading Capacity			Lock		Inland Waterway (IW)		Forecast Traffic by IWTM (2027) (ton/day)	
					Lock (hr/unit)	IW (hr/traffic)	Dead Weight Tonnage (DWT) (ton/barge)	Load Factor	Unit Type Single	Corrected Capacity (ton/unit)	[10]-[2][4] (unit/day)	[11]-[9][10] (ton/day)	[12] (unit/day)		[13]-[9][12] (ton/day)
Cairo-Alex	(After El Nahi - Entrance Lock)	29	24	8	-	-	[5]-[1][3]	[6]	[7]	[8]	[9]-[6][7][8]	-	-	[14] (ton/day)	
	Entrance Lock	42	24	8	0.75	5.3	1,430	0.7	1	1,001	32	32,032	43	43,492	
	Khalaba Lock	40	24	8	0.75	5.0	1,430	0.7	1	1,001	32	32,032	41	41,421	
	Boulin Lock	28.5	24	8	0.75	3.6	1,430	0.7	1	1,001	32	32,032	29	29,512	
	Buistan Lock	33.5	24	8	0.75	4.2	1,430	0.7	1	1,001	32	32,032	35	34,690	
	Janakless Lock	39	24	8	0.75	4.9	1,430	0.7	1	1,001	32	32,032	40	40,385	
	El Nihadia Lock	20	24	8	0.75	2.5	1,430	0.7	1	1,001	32	32,032	21	20,710	
	End Lock	203	24	8	0.75	30.6	-	-	-	-	-	-	210	210,210	5,700
	Sub-Total														
	Cairo-Damietta	(After El Nahi - New Delta Barrage Lock)	29	12	-5	-	-	1,430	0.7	1	1,001	-	-	-	-
New Delta Barrage Lock		88	24	-5	0.50	5.9	1,430	0.7	1	1,001	48	48,048	59	59,146	
Zefra Barrage Lock		134	24	-5	0.50	8.9	1,430	0.7	1	1,001	48	48,048	89	89,052	
Damietta Lock		18	24	-5	0.50	1.2	1,430	0.7	1	1,001	48	48,048	12	11,962	
Damietta Port		241	24	-5	0.50	18.1	-	-	-	-	-	-	160	160,160	20,000
Sub-Total															
Cairo-Aswan	(After El Nahi - Asyut Barrage Lock)	380	24	-5	0.75	25.3	1,430	0.7	1	1,001	32	32,032	253	253,587	
	Asyut Barrage Lock	183.5	24	-5	0.75	12.2	1,430	0.7	1	1,001	32	32,032	172	172,456	
	New Nagi Hamadi Barrage Lock	3.5	24	-5	0.75	0.2	1,430	0.7	1	1,001	2	2,336	2	2,336	
	Old Nagi Hamadi Barrage Lock	189	24	-5	0.75	12.6	1,430	0.7	1	1,001	32	32,032	126	126,126	
	New Esna Barrage Lock	170	24	-5	0.75	11.3	1,430	0.7	1	1,001	32	32,032	113	113,447	
Sub-Total	926	0	-5	-	64.7	-	-	-	-	-	-	-	617	617,951	
<b>Total</b>	<b>1,370</b>				<b>113.4</b>										

**Note:**

- Highlighted capacities in pink color are not able to flow corresponded traffic, which may create traffic congestion.
- Double-underlined capacity in Cairo-Aswan IW is locally out of forecast traffic. However this is not critical and accommodative resultantly, because the local traffic forecast (15,000 ton/day) is ranged within the total of the double-underlined and the half capacity estimated of the IW between Asyut and New Nagi Hamadi Barrage Locks.

## APPENDIX-11

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### PRELIMINARY PORT PLANNING FOR NEW CANDIDATE RIVER PORTS

## PRELIMINARY PORT PLANNING FOR NEW CANDIDATE RIVER PORTS

### 1) Methodology

Basic dimensions of new candidate ports are estimated by the following procedure:

- ✚ Assume cargo traffic volume to be handled at each candidate port
- ✚ Estimate future cargo throughput and number of calling barge
- ✚ Apply standard formulas for determine basic dimensions of each port

### 2) Prerequisites

In order to estimate required new port dimensions based on assumed cargo volumes for each candidate port, the following prerequisites are applied upon its computation:

#### a) Cargo Volume covered for each Candidate Port

Cargo Volumes for each candidate port are estimated based on the future cargo traffic volume by NaTM for coverage areas assumed to each candidate port as shown in TableAPX11-1.

#### b) Cargo Throughput and Calling Barge

Based on the summarized traffic volumes obtained from Table APX11-1, cargo throughput and number of calling barge are estimated as Table APX11-2.

#### c) Target Fleets

Barge dimensions for both container and general cargo are sourced from 2003 JICA Study Report.

#### d) Applicable Formulas, Coefficient Factor etc. in Computation

Applied standard formulas and relevant factors are sourced from 2003 JICA Study Report.

### 3) Results of Computation

Tables APX11-3 and -4 describe the results of the estimated basic dimensions of each candidate port.



Table APX11-1 Expected Cargo Traffic Volume for Assumed Coverage Areas of New Candidate Ports (2027)

ROUTE 1: CAIRO-ASWAN				Both Directions		Total Forecast Traffic Volume for Assumed Coverage Area				Weighted Cargo Volume		Share Factor	Corrected Cargo Volume		Remark	
SEQ	N	LZ	PORT	In (ton/day)	Out (ton/day)	In (ton/day)	Out (ton/day)	Combined (ton/day)	Container (ton/yr)	G. Cargo (ton/yr)	0.7	0.3	Container (ton/yr)	G. Cargo (ton/yr)		
1	42020	1	Ather El Nabi	13,613.85	8,019.71											
2	42051	1	Torah	304.59	348.11											
3	42052	6	Hawamdia	3.08	34.80											
4	42053	6	Helwan/Kafir	82.85	202.33											
5	42055	7	El Shobbk (Limestone)	79.72	103.15	703	256,537	1,009	368,343	1,712	624,880	0.86	437,416	624,880	537,397	Expected Coverage Areas for South Cairo Port
6	42056	7	Tebbin	114.74	176.54											
7	42026	34	Samalut	55.93	69.30											
8	42057	34	El Minya	57.54	71.89											
9	42058	34	Abu Qurgas	4.39	3.04											
10	42059	36	Mankabad	94.91	177.22											
11	42060	36	Asyut	1,059.80	1,937.62	2,603	950,270	4,089	1,492,427	6,692	2,442,697	0.86	1,709,888	732,809	630,216	Expected Coverage Areas for New Asyut Port
12	42061	38	Sohag	989.78	1,338.90											
13	42062	38	Girga	458.99	635.10											
14	42063	41	Nag Hammadi	1,145.27	1,978.77											
15	42071	39	Dishna	508.97	1,295.11											
16	42083	39	Gent	1,804.31	3,447.34											
17	42064	40	Qus	444.95	230.91	3,758	1,375,396	6,851	2,500,794	10,620	3,876,180	0.86	2,713,326	1,162,854	233,946	Expected Coverage Areas for New Quena Port
18	42065	42	Luxor	635.29	1,321.03											
19	42066	43	Armani	274.55	557.10											
20	42067	45	El-Sibaya	652.18	657.56											
21	42068	44	Edfu	438.64	353.28											
22	42070	44	Aswan	294.53	32.90											
23	42073	44	El Sad El-Ali (Wadi El-Nile)	112.11	308.12											
24	42038	44	Wadi Halfa	49.31	80.56											

Note: weight of container and general cargo, and share factor used in the above table are assumed based on forecast traffic volumes by commodities. Assumed conversion rate of container is 10 ton/1E.U.

Source: JICA Study Team



Table APX11-2 Estimated Basic Dimensions of New Candidate Ports (Container Terminal)

Cargo Throughput					
Cargo Item	Cargo Type	Unit	Inbound	Outbound	Total
South Cairo Port	Container	('000 TEU)	38	38	75
	General Cargo	('000 MT)	161		161
New Asuytt Port (Middle Egypt)	Container	('000 TEU)	147	147	294
	General Cargo	('000 MT)	630		630
New Quena Port (Upper Egypt)	Container	('000 TEU)	233	233	467
	General Cargo	('000 MT)	1,000		1,000
Total	Container	('000 TEU)	418	418	836
	General Cargo	('000 MT)	1,791	0	1,791

Calling Barge					
Cargo Item	Cargo Type	Unit	Inbound	Outbound	Number of Barge
South Cairo Port	Container	96 TEU/barge	392	392	392
	General Cargo	1378 MT/barge	117		117
New Asuytt Port (Middle Egypt)	Container	96 TEU/barge	1,532	1,532	1,532
	General Cargo	1378 MT/barge	457		457
New Quena Port (Upper Egypt)	Container	96 TEU/barge	2,431	2,431	2,431
	General Cargo	1378 MT/barge	726		726

Source: JICA Study Team

Table APX11-3 Estimated Basic Dimensions of New Candidate Ports (Container Terminal)

Item of Basic Requirements	Cargo Type	Container (including Containerizable)		
	Location	South Cairo	New Asyut	New Quena
	Unit \ Year	2027	2027	2027
<b>A TARGET VESSEL</b>				
Vessel Type		Barge	Barge	Barge
Length	m	100	100	100
Beam	m	12	12	12
Draft	m	1.6	1.6	1.6
Air Draft	m	-	-	-
Loading Capacity	TEU	96	96	96
Motive Power		Self-propelled	Self-propelled	Self-propelled
Speed	knt	7	7	7
<b>B REQUIRED PORT FACILITIES</b>				
<b>B1 Berth Dimensions</b>				
Berth Length	m	115	115	115
Depth	m	1.8	1.8	1.8
<b>B2 Handling Productivity</b>				
Av. Productivity	box/crane/hr	15	15	15
Loading/Unloading Equipment				
Type of Equipment		Quayside Crane	Quayside Crane	Quayside Crane
Number of Equipment per Berth	nr/berth	2	2	2
<b>B3 Number of Berth</b>				
Required Nr. of Berth	nr	0.3	1.3	2.1
Berthing Time per Barge	hr	4.8	4.8	4.8
Working Time per Day	hr	24	24	24
Annual Maximum Working Day	day/year	335	335	335
Nr. of Calling Container Barge per Year	barge	392	1,532	2,431
Nr. of Loading/Unloading Container per Barge	TEU	192	192	192
Conversion Ratio (20'/40')	TEU/box	1.67	1.67	1.67
Berth Occupancy Ratio	%	70	70	70
Non-operational Hours at Berthing & Deberthing	hr	1	1	1
<b>B5 Terminal Area</b>				
Required Terminal Area	ha	2.5	9.7	15.3
Av. Terminal Area per TEU Ground Slot upon Actual Records	m <sup>2</sup> /TEU	70	70	70
<b>C REQUIRED CARGO HANDLING EQUIPMENT</b>				
<b>C1 Quayside Crane</b>				
Required Nr. of Quayside Crane	nr	0.6	2.4	3.9
Annual Container Throughput	'000TEU/year	75	294	467
Annual Maximum Working Day	day/year	335	335	335
Working Time per Day	hr/day	24	24	24
Berth Occupancy Ratio	%	70	70	70
Net Productivity of Quayside Crane	box/crane/hr	20	20	20
Percentage of Availability	%	80	80	80
Container Operation Efficiency Ratio		0.8	0.8	0.8
Conversion Ratio (20'/40')	TEU/box	1.67	1.67	1.67
<b>C3 Prime Mover (Tractor/Trailer)</b>				
Required Nr. of Yard Tractor Trailer	nr	3	9	12
Nr. of Quayside Crane	nr	1	3	4
Nr. of Yard Tractor Trailer per Quayside Crane	nr/crane	3	3	3
Av. Travel Speed of Yard Tractor Trailer	km/hr	15	15	15
Handling Time under Quayside Crane	min/cycle	3	3	3
Handling Time under RTG	min/cycle	3	3	3
Av. Traveling Distance of Yard Tractor	km/cycle	0.7	0.7	0.7
Operation Factor		0.7	0.7	0.7
<b>C4 Forklift/Reach Stacker</b>				
Required Nr. of Reach Stacker at Apron	nr	1	1	2
Required Nr. of Reach Stacker at Shed and Open Yard	nr	1	2	3

Source: JICA Study Team

Table APX11-4 Estimated Basic Dimensions of New Candidate Ports (General Cargo Terminal)

Item of Basic Requirements	Cargo Type	General Cargo		
	Location	South Cairo	New Asyut	New Quena
	Unit \ Year	2027	2027	2027
<b>A TARGET VESSEL</b>				
Vessel Type		Barge	Barge	Barge
Length	m	100	100	100
Beam	m	12	12	12
Draft	m	1.6	1.6	1.6
Air Draft	m	-	-	-
Loading Capacity	MT	1,378	1,378	1,378
Motive Power		Self-propelled	Self-propelled	Self-propelled
Speed	knt	7	7	7
<b>B REQUIRED PORT FACILITIES</b>				
<b>B1 Berth Dimensions</b>				
Berth Length	m	115	115	115
Depth	m	1.8	1.8	1.8
<b>B2 Handling Productivity</b>				
Av. Productivity	MT/hr/bargge	105	105	105
Loading/Unlaoding Equipment				
Type of Equipment		Truck Crane	Truck Crane	Truck Crane
Number of Equipment per Berth	nr/berth	2	2	2
<b>B3 Number of Berth</b>				
Required Nr. of Berth	nr	0.2	0.9	1.5
Berthing Time per Barge	hr	7.6	7.6	7.6
Working Time per Day	hr	16	16	16
Annual Maximum Working Day	day/year	335	335	335
Nr.of Calling General Cargo Barge per Year	barge	117	457	726
Berth Occupancy Ratio	%	70	70	70
Non-operational Hours at Berthing & Deberthing	hr	1	1	1
<b>B4 Shed and Open Yard</b>				
Required Shed Area	m2	3,354	9,708	20,804
Annual cargo-wise throughput of conventional cargo	'000 ton/year	113	327	700
Annual Maximum Working Day	day/year	335	335	335
Cargo-wise Peack Factor to Daily Av. Handling Demand		1.6	1.6	1.6
Av. Dweling Time	day	7	7	7
Cargo-wise Unit Load per Square Meter for Storage	ton/m2	3	3	3
Passage Ratio		0.5	0.5	0.5
Operational Factor		0.75	0.75	0.75
Required Yard Area	m2	2,156	13,531	44,580
Annual cargo-wise throughput of conventional cargo	'000 ton/year	48	304	1,000
Annual Maximum Working Day	day/year	335	335	335
Cargo-wise Peack Factor to Daily Av. Handling Demand		1.6	1.6	1.6
Av. Dweling Time	day	7	7	7
Cargo-wise Unit Load per Square Meter for Storage	ton/m2	2	2	2
Passage Ratio		0.5	0.5	0.5
Operational Factor		0.75	0.75	0.75
<b>C REQUIRED CARGO HANDLING EQUIPMENT</b>				
<b>C1 Quayside Crane</b>				
Required Nr. of Mobile Truck Crane	nr	0.5	1.8	2.9
<b>C2 Forklift/Reach Stacker</b>				
Required Nr. of Reach Stacker at Apron	nr	1	1	2
Required Nr. of Reach Stacker at Shed and Open Yard	nr	1	1	2

Source: JICA Study Team

## APPENDIX-12

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### COST INFORMATION

Table APX12-1 Basic Cost Information

Category	Particular Name/Location	Work Scope	Basic Dimensions/Spec.	Completed Year		Project Cost	Remark
				Start	Complete		
Dredging	Aswan-Cairo		Av. 3 million m3/yr				
	Alex-Cairo (Nubaria Canal)	Syvey, dredging, transfer mobilization and dimobilization	Av. 2 million m3/yr			20-30 EL/m3	Maintenance dredging Av. 7 million m3/yr
	Alex-Cairo (Behairy Canal)		Av. 1,000 m3/yr				
	Damietta-Cairo		Av. 1.5 million m3/yr				
Lock	Delta Lock	Lock, tower, yard & landscaping	L=150m x W=17m	1996	2005	104 million EL	
	Zefta Lock	Lock, tower, yard, brisge & land scaping		1997	2004	104 million EL	
	Nahda Lock	Lock, tower, yard & landscaping		2005		97 million EL	
	Small Lock	Lock extension		2005		89 million EL	suspended
	All	Maintenance	every 5 year			6million EL/lock	
Bridge	Alex. Railway & Road Bridge	Changing into movable bridge				25 million EL	Waiting for approval
	Aswan-Cairo	Buoy & Beacon	Cairo-Assuit only, Av. 2km/pc		2005	3.2 million EL	
Navigation Aids	Alex-Cairo (Nubaria Canal)	Light Tower	Av. Every 1km/tower			7.3 million EL	
	Alex-Cairo (Behairy Canal)						
	Damietta-Cairo	to be reconditioned and installed	420pcs			4 million EL	Local Materials 2 million Recondition&Installation 2 million
RIS	Aswan-Cairo			2009	2010	200 million EL	
	Alex-Cairo (Nubaria Canal)	Not yet					
	Alex-Cairo (Behairy Canal)	Not yet					
	Damietta-Cairo	Not yet					
Port	Aswan-Cairo						
	Alex-Cairo (Nubaria Canal)	Refer to 2003 JICA Report					
	Alex-Cairo (Behairy Canal)						
	Damietta-Cairo						
Hydrographic Survey & Mapping	Aswan-Cairo				2005	7.5 Milion EL	
	Alex-Cairo (Nubaria Canal)						
	Alex-Cairo (Behairy Canal)						
	Damietta-Cairo						

Source: RTA and 2003 JICA Study Report

Table APX12-2 Cost Estimate for New Port Development (Cairo South Port)

Ref. No.	Description	Unit	Q'ty	Unit Price (L.E.)	Cost (1,000 L.E.)				
					F/C	L/C	Combined		
<b>I</b>	<b>Terminal Construction</b>				<b>167,046</b>	<b>83,904</b>	<b>250,950</b>		
<b>1</b>	<b>Preparatory Work</b>				<b>0</b>	<b>0</b>	<b>0</b>		
1.1	Land acquisition	m2	30,000	0	0	0	1.00	0	
<b>2</b>	<b>Civil &amp; Archtectual Works</b>				<b>147,781</b>	<b>63,456</b>	<b>211,238</b>		
2.1	Site Clearance								
2.1.1	Site clearnace	m2	30,000	2	0	69	1.00	69	
2.1.2	Demolition of Existing bak protection	lm	115	5,250	120.75	0.20	483	0.80	604
2.3	Dredging	m3	6,000	69	0	414	1.00	414	
2.4	Quay wall	lm	230	800,000	138000	0.75	46,000	0.25	184,000
2.5	Yard pavement	m2	23,000	230	1322.5	0.25	3,968	0.75	5,290
2.6	Yard utility	m2	23,000	69	396.75	0.25	1,190	0.75	1,587
2.7	Terminal buildings								
2.7.1	CFS	m2	1,300	1,610	1255.8	0.60	837	0.40	2,093
2.7.2	Administration bldg.	m2	500	2,300	460	0.40	690	0.60	1,150
2.7.3	Workshop	m2	1,000	1,610	966	0.60	644	0.40	1,610
2.7.4	Shed	m2	3,000	1,035	1863	0.60	1,242	0.40	3,105
2.7.5	Other terminal buildings & fence/gate	m2	30,000	55	728.64	0.44	927	0.56	1,656
1.8	Access road	lm	500	18,400	2300	0.25	6,900	0.75	9,200
1.9	Aids to Navigation	ls	1	460,000	368	0.80	92	0.20	460
<b>3</b>	<b>Enigneering Services (8% of 1)</b>				<b>10,139</b>	<b>6,760</b>	<b>16,899</b>		
<b>4</b>	<b>Contingencies (10% of 1+2+3)</b>				<b>9,125</b>	<b>13,688</b>	<b>22,814</b>		
<b>II</b>	<b>Procurement</b>				<b>56,224</b>	<b>3,473</b>	<b>59,697</b>		
<b>1</b>	<b>Cargo Handling Equipment</b>				<b>50,184</b>	<b>2,762</b>	<b>52,946</b>		
1.1	Mobile quayside crane	nr	2	20,723,000	39,374	0.95	2072.3	0.05	41,446
	Container yard transfer crane (RTG, 40t cap.)	nr	0	10,810,000	0	0.9	0	0.1	0
	Tractor head (40')	nr	0	920,000	0	0.97	0	0.03	0
	Trailer (40')	nr	0	460,000	0	0.97	0	0.03	0
	Quayside truck crane (60-80t)	nr	2	4,600,000	8,740	0.95	460	0.05	9,200
	Track Scale (80t)	nr	1	2,300,000	2,070	0.9	230	0.1	2,300
	Reach Stacker	nr	0	3,783,500	0	0.9	0	0.1	0
<b>2</b>	<b>Enigneering Services (2.5% of 1)</b>				<b>993</b>	<b>331</b>	<b>1,324</b>		
<b>3</b>	<b>Contingencies (10% of 1+2)</b>				<b>5,047</b>	<b>380</b>	<b>5,427</b>		
<b>III</b>	<b>Total Project Cost (I+II)</b>				<b>223,270</b>	<b>87,377</b>	<b>310,647</b>		

310,000

Source: JICA Study Team

Table APX12-3 Cost Estimate for New Port Development (New Asyut Port)

Ref. No.	Description	Unit	Q'ty	Unit Price (L.E.)	Cost (1,000 L.E.)				
					F/C	L/C	Combined		
<b>I</b>	<b>Terminal Construction</b>				<b>261,686</b>		<b>151,039</b>	<b>412,725</b>	
<b>1</b>	<b>Preparatory Work</b>				<b>0</b>		<b>0</b>	<b>0</b>	
1.1	Land acquisition	m2	45,000	0	0		0	1.00	0
<b>2</b>	<b>Civil &amp; Archtectual Works</b>				<b>230,002</b>		<b>117,410</b>	<b>347,412</b>	
2.1	Site Clearance								
2.1.1	Site clearnace	m2	45,000	460	0		20,700	1.00	20,700
2.1.2	Demolition of Existing bak protection	lm	175	5,250	183.75	0.20	735	0.80	919
2.3	Dredging	m3	8,000	69	0		552	1.00	552
2.4	Quay wall	lm	350	800,000	210000	0.75	70,000	0.25	280,000
2.5	Yard pavement	m2	35,000	230	2012.5	0.25	6,038	0.75	8,050
2.6	Yard utility	m2	35,000	69	603.75	0.25	1,811	0.75	2,415
2.7	Terminal buildings								
2.7.1	CFS	m2	7,700	1,610	7438.2	0.60	4,959	0.40	12,397
2.7.2	Administration bldg.	m2	500	2,300	460	0.40	690	0.60	1,150
2.7.3	Workshop	m2	1,500	1,610	1449	0.60	966	0.40	2,415
2.7.4	Shed	m2	6,000	1,035	3726	0.60	2,484	0.40	6,210
2.7.5	Other terminal buildings & fence/gate	m2	45,000	55	1092.96	0.44	1,391	0.56	2,484
1.8	Access road	lm	500	18,400	2300	0.25	6,900	0.75	9,200
1.9	Aids to Navigation	ls	2	460,000	736	0.80	184	0.20	920
<b>3</b>	<b>Enigneering Services (8% of 1)</b>				<b>16,676</b>		<b>11,117</b>		<b>27,793</b>
<b>4</b>	<b>Contingencies (10% of 1+2+3)</b>				<b>15,008</b>		<b>22,512</b>		<b>37,520</b>
<b>II</b>	<b>Procurement</b>				<b>112,447</b>		<b>6,946</b>		<b>119,393</b>
<b>1</b>	<b>Cargo Handling Equipment</b>				<b>100,367</b>		<b>5,525</b>		<b>105,892</b>
1.1	Mobile quayside crane	nr	4	20,723,000	78,747	0.95	4144.6	0.05	82,892
	Container yard transfer crane (RTG, 40t cap.)	nr	0	10,810,000	0	0.9	0	0.1	0
	Tractor head (40')	nr	0	920,000	0	0.97	0	0.03	0
	Trailer (40')	nr	0	460,000	0	0.97	0	0.03	0
	Quayside truck crane (60-80t)	nr	4	4,600,000	17,480	0.95	920	0.05	18,400
	Track Scale (80t)	nr	2	2,300,000	4,140	0.9	460	0.1	4,600
	Reach Stacker	nr	0	3,783,500	0	0.9	0	0.1	0
<b>2</b>	<b>Enigneering Services (2.5% of 1)</b>				<b>1,985</b>		<b>662</b>		<b>2,647</b>
<b>3</b>	<b>Contingencies (10% of 1+2)</b>				<b>10,094</b>		<b>760</b>		<b>10,854</b>
<b>III</b>	<b>Total Project Cost (I+II)</b>				<b>374,133</b>		<b>157,985</b>		<b>532,118</b>

540,000

Source: JICA Study Team



Table APX12-4 Cost Estimate for New Port Development (New Quena Port)

Ref. No.	Description	Unit	Q'ty	Unit Price (L.E.)	Cost (1,000 L.E.)				
					F/C	L/C	Combined		
<b>I</b>	<b>Terminal Construction</b>				<b>338,145</b>	<b>164,439</b>	<b>502,584</b>		
1	Preparatory Work				0	0	0		
1.1	Land acquisition	m2	48,000	0	0	0	1.00	0	
2	Civil & Architectural Works				<b>299,563</b>	<b>123,487</b>	<b>423,051</b>		
2.1	Site Clearance								
2.1.1	Site clearance	m2	48,000	2	0	110	1.00	110	
2.1.2	Demolition of Existing bak protection	lm	230	5,250	241.5	0.20	966	0.80	1,208
2.3	Dredging	m3	10,000	69	0	690	1.00	690	
2.4	Quay wall	lm	460	800,000	276000	0.75	92,000	0.25	368,000
2.5	Yard pavement	m2	46,000	230	2645	0.25	7,935	0.75	10,580
2.6	Yard utility	m2	46,000	69	793.5	0.25	2,381	0.75	3,174
2.7	Terminal buildings								
2.7.1	CFS	m2	9,900	1,610	9563.4	0.60	6,376	0.40	15,939
2.7.2	Administration bldg.	m2	500	2,300	460	0.40	690	0.60	1,150
2.7.3	Workshop	m2	2,000	1,610	1932	0.60	1,288	0.40	3,220
2.7.4	Shed	m2	6,000	1,035	3726	0.60	2,484	0.40	6,210
2.7.5	Other terminal buildings & fence/gate	m2	48,000	55	1165.82	0.44	1,484	0.56	2,650
1.8	Access road	lm	500	18,400	2300	0.25	6,900	0.75	9,200
1.9	Aids to Navigation	ls	2	460,000	736	0.80	184	0.20	920
3	Engineering Services (8% of 1)				<b>20,306</b>		<b>13,538</b>		<b>33,844</b>
4	Contingencies (10% of 1+2+3)				<b>18,276</b>		<b>27,414</b>		<b>45,689</b>
<b>II</b>	<b>Procurement</b>				<b>112,447</b>	<b>6,946</b>	<b>119,393</b>		
1	Cargo Handling Equipment				<b>100,367</b>	<b>5,525</b>	<b>105,892</b>		
1.1	Mobile quayside crane	nr	4	20,723,000	78,747	0.95	4144.6	0.05	82,892
	Container yard transfer crane (RTG, 40t cap.)	nr	0	10,810,000	0	0.9	0	0.1	0
	Tractor head (40')	nr	0	920,000	0	0.97	0	0.03	0
	Trailer (40')	nr	0	460,000	0	0.97	0	0.03	0
	Quayside truck crane (60-80t)	nr	4	4,600,000	17,480	0.95	920	0.05	18,400
	Track Scale (80t)	nr	2	2,300,000	4,140	0.9	460	0.1	4,600
	Reach Stacker	nr	0	3,783,500	0	0.9	0	0.1	0
2	Engineering Services (2.5% of 1)				<b>1,985</b>		<b>662</b>		<b>2,647</b>
3	Contingencies (10% of 1+2)				<b>10,094</b>		<b>760</b>		<b>10,854</b>
<b>III</b>	<b>Total Project Cost (I+II)</b>				<b>450,592</b>	<b>171,385</b>	<b>621,977</b>		

630,000

Source: JICA Study Team