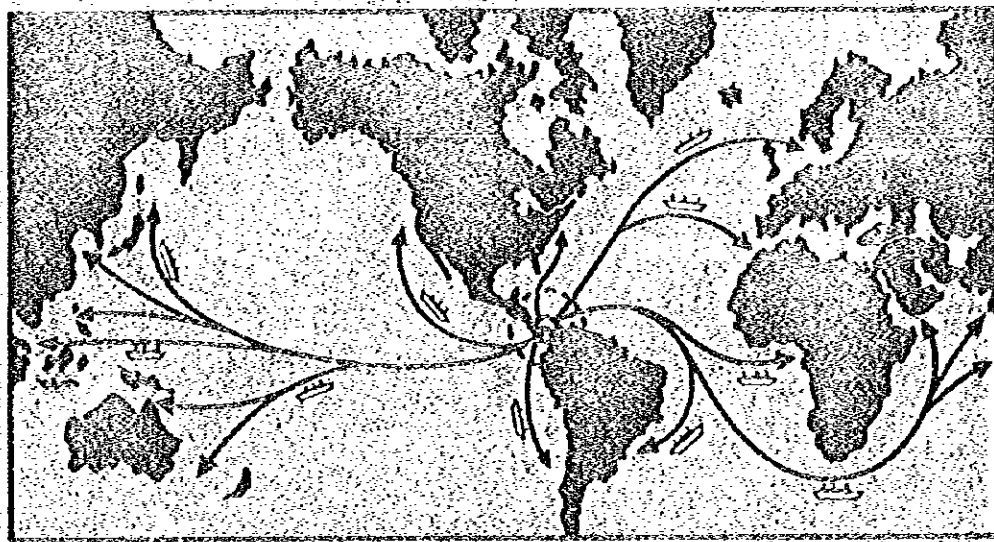
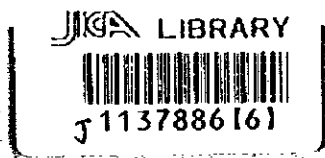


NATIONAL PORT AUTHORITY
THE REPUBLIC OF PANAMA

THE STUDY ON THE DEVELOPMENT PLAN OF THE PORT OF BALBOA IN THE REPUBLIC OF PANAMA

FINAL REPORT

PART I PRESENT SITUATION



JUNE 1997

THE OVERSEAS COASTAL AREA DEVELOPMENT INSTITUTE OF JAPAN (OCDI)
PACIFIC CONSULTANTS INTERNATIONAL (PCI)

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NATIONAL PORT AUTHORITY
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1137886(6)

PREFACE

In response to a request of the Government of the Republic of Panama, the Government of Japan took pleasure in conducting a study on the development of the port of Balboa and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Panama a study team headed by Mr. Takao HIROTA, President of the Overseas Coastal Area Development Institute of Japan (OCDI), and composed of members from this institute and another company, Pacific Consultants International (PCI), three times between May 1996 and March 1997.

The team held discussions with the officials concerned of the Government of Panama, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Panama for the close cooperation they extended to the team.

June 1997

A handwritten signature in black ink, appearing to read 'Kimio Fujita', with a long horizontal flourish extending to the right.

Kimio FUJITA

President

Japan International Cooperation Agency

LETTER OF TRANSMITTAL

June 1997

Mr. Kimio FUJITA
President
Japan International Cooperation Agency

Dear Sir,

I have the honor to submit herewith the Final Report for the Study on the Development Plan of the Port of Balboa in the Republic of Panama.

This report is the outcome of works between March 1996 and June 1997 which included three field surveys. The work was undertaken by the Overseas Coastal Area Development Institute of Japan (OCDI) and Pacific Consultants International (PCI) as per the contract with the Japan International Cooperation Agency (JICA).

Based on the findings of these surveys and utilizing data and information collected, and along the line of the scope of work which was agreed upon by both governments, the report is formulated to cover the following subjects;

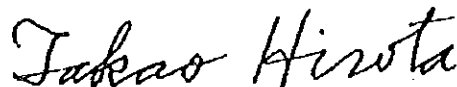
- (1) To formulate a master plan for the existing port and new terminals for container cargoes, etc., up to the year 2015
- (2) To conduct a feasibility study on a short-term plan up to the year 2005 based on the master plan.

The study shows the importance of the overall development of the Port of Balboa and its proper administration, management and operation. I earnestly hope that necessary measures will be taken to implement the projects and recommendations.

I would like to note that the completion of the study is greatly owed to the collaboration with APN (Autoridad Portuaria Nacional) and other related ministries, government agencies, authorities, shipping lines and agents.

I am also greatly indebted to JICA, the Ministry of Foreign Affairs, the Ministry of Transport and the Embassy of Japan in Panama for giving us valuable advice and assistance at every step throughout the course of the study.

Yours sincerely,



Takao HIROTA
Team Leader for the Study
on the Development Plan of the Port of Balboa

CURRENT LAND USE



APN (Land)

PCC



APN (Water)



U.S. Base



Air Port

ABBREVIATION LIST

A	APN	National Port Authority
	APSA	Atlantic-Pacific, S.A.
	ARI	Interoceanic Regional Authority
B	B/L	Bill of Lading
	BNP	Panama National Bank
	BOD	Biochemical Oxygen Demand
	BOT	Build, Operate and Transfer
C	CCT	Colon Container Terminal
	CFC	Conversion Factor for Consumption
	CFS	Container Freight Station
	CIF	Cost, Insurance and Freight
	CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
	COD	Chemical Oxygen Demand
	COFRISA	Consortium for the Development of Folk River, S.A.
CPC	Centerport Concept	
D	DO	Dissolved Oxygen
	DWT	Dead Weight Tonnage
E	EIA	Environmental Impact Assessment
	EIRR	Economic Internal Rate of Return
	EIS	Environmental Impact Study
	EPZ	Export Processing Zone
F	FCL	Full Container Load
	FEU	Forty-foot Equivalent Unit
	FIO	Free In and Out
	FOB	Free on Board
G	GCO	Office of General Comptroller
	GDP	Gross Domestic Products
	GT	Gross Tonnage
H	HHW	Highest High Water
	HIT	Hongkong International Terminals
I	IDB	Inter-American Development Bank
	IEE	Initial Environmental Examination
	IMF	International Monetary Fund
	IMO	International Maritime Organization

	INRENARE	National Institute for the Renewable Natural Resources
L	LAQ	Lease a Quay
	LCL	Less than Container Load
	LLW	Lowest Low Water
	LPG	Liquid Propane Gas
	LUP	License to Use a Port
M	MARPOL	Prevention of Pollution of the Sea from Ships 1973 and the Protocol of 1978
	M/O or O/M	Maintenance and Operation, or Operation and Maintenance
	MHW	Mean High Water
	MIPPE	Ministry of Planning and Economic Policy
	MIT	Manzanillo International Terminal
	MLB	Mini Land Bridge
	MLW	Mean Low Water
	MLWS	Mean Low Water Spring
	MSL	Mean Sea Level
N	NPV	Net Present Value
O	ODA	Official Development Assistance
P	PCC	Panama Canal Commission
	PLD	Precise Level Datum
	PPC	Panama Ports Company, S. A.
	PTP	Petroterminal de Panama, S.A.
R	Ro-Ro	Roll-on Roll-off
S	SCF	Standard Conversion Factor
	SPM	Suspended Particulate Matter
	SS	Suspended Solid
T	TEU	Twenty-foot Equivalent Unit
	T-N	Total Nitrogen
	T-P	Total Phosphorus
U	UN	United Nations
	UNCTAD	United Nations Conference on Trade and Development
	US	United States of America
Z	ZLC	Colon Free Zone

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I GENERAL DESCRIPTION OF PANAMA

1.1 History, Geography, Topography And Climate

(1) History

1. Vasco Nunez de Balboa's discovery of the "Southern Sea" (Pacific Ocean) on September 25, 1513, 12 years after Rodrigo de Bastidas discovered the Isthmus, was the initiation of Panama's history as an international trade center.

2. Between 1544 and 1731, the Portobelo Fairs turned Panama into a major world trade center. The attacks by pirates and corsairs adversely affected Panama's importance later, until the old Panama Railroad Company in the 1850s built the Transisthmian Railroad, which drew adventurers seeking gold to the California mines via the Isthmus. The second half of the 19th century was characterized for being the period when the need to build an interoceanic canal connecting the Atlantic and Pacific Oceans was discussed.

3. Since its independence from Spain, Panama immediately annexed to Colombia in 1821, and became one of its States until the secession in 1903. In the same year, the United States signed the treaty by which it undertook the construction of the canal. The U.S. effort and the culmination of the "dream of centuries" came into being on August 15th, 1914, opening a new maritime route to world trade and a new and promising future for the Republic of Panama.

4. The importance of the registry and the efficient operation of the Interoceanic Canal gave Panama great importance in the maritime world. Panama's role gained new importance in 1977 when the Torrijos-Carter Treaties, the Canal Treaty, and the Treaty Concerning the Permanent Neutrality and Functioning of the Panama Canal were approved. The treaties went into effect in 1979. The treaty stipulates transfer of Canal administration from USA to Panama by the end of the year 1999. Based on this treaty, the Government of Panama, USA and Japan jointly studied on the sea-level canal or possible alternative for the existing canal to prepare for larger international traffic after the year 2000.

(2) Geography and Topography

5. Panama, with an area of 75,517 square kilometers, is located between North and South America, bordering the Caribbean Sea to the north and the Pacific Ocean to the south, Colombia to the east and Costa Rica to the west (between seven degrees

12' and nine degrees 39' north latitude and 77degrees 10' and 83 degrees 03' west longitude). The shape of the country is long from east to west and narrow from north to south. The width of the country is 50 kilometers at the narrowest point, and only 190 kilometers even at the widest points. Panama is a mountainous country, the highest is Volcan Baru in the Chiriqui Province which has a height of 3,475 meters and is located in the western part of the country.

(3) Climate

6. Panama is located in a tropical zone. The annual mean air temperature is 26 degrees centigrade in the coastal district and 19 degrees centigrade in the mountain district. There are two distinct seasons: a dry season from January to April and a rainy season from May to December. Precipitation registers more than 5,000 millimeters in the Caribbean Sea coastal district.

1.2 Socio-economic Activity

1.2.1 Population

7. Table 1-2-1 and Figure 1-2-1 show the general trend of the population in Panama by province. As shown in the table and Figure, the population of Panama has increased rapidly, especially since 1960's. It reached 2.3 million in 1990, though it was only 1.1 million in 1960. The average growth rate from 1980 to 1990 is about 2.6% per year.

8. Among the provinces, Panama province has the largest portion of national population. It is 1.1 million in 1990 representing 46% of the population. Chiriqui province has the second largest population followed by the provinces of Veraguas and Colon with population of 370, 204 and 202 thousand in 1990, respectively.

9. While the population share of the province of Panama has increased, most of other provinces have declined in population, which shows clearly that the population has been concentrating in the province of Panama.

10. In the table and the figure, the projection of population up year 2015 is also shown. According to the projection, the average growth rate over 1995 to 2015 is about 1.4% per year which is almost a half of 2.6% over 1960 to 1990.

Table 1-2-1 Population by Province in Panama

Year	National Population	Bocas del Toro	Cocle	Colon *	Chiriqui	Darien	Herrera	Los Santos	Panama	Veraguas
1911	336,742	22,732	35,011	32,092	63,364	8,992	23,007	30,075	61,855	59,614
1920	416,098	27,239	45,151	58,250	76,470	10,728	28,981	31,638	98,035	66,603
1930	467,459	15,851	48,244	57,161	76,918	13,391	31,030	11,218	111,103	69,513
1940	622,576	16,523	55,737	78,119	111,206	11,930	38,118	19,621	173,328	81,991
1950	805,285	22,392	73,103	90,111	138,136	11,660	50,095	81,122	218,335	106,998
1960	1,075,511	32,600	93,156	105,116	188,350	19,715	61,672	70,551	372,393	131,685
1970	1,428,082	43,531	118,003	131,286	236,151	22,685	72,519	72,380	576,615	151,819
1980	1,805,287	53,187	140,903	162,151	287,350	26,524	81,963	70,261	809,100	173,215
1990	2,329,329	93,361	173,190	202,338	370,227	43,832	93,681	76,917	1,072,127	203,626
1995	2,631,013	119,336	189,579	226,139	407,819	55,538	101,198	79,935	1,232,390	219,049
2000	2,855,703	140,923	200,079	240,264	433,500	65,412	104,070	79,514	1,367,593	224,348
2005	3,067,480	163,697	209,278	252,633	451,661	76,163	105,911	78,143	1,500,296	226,692
2010	3,265,166	187,388	216,918	263,608	476,870	87,553	106,780	75,989	1,625,232	225,798
2015	3,451,401	211,519	222,881	273,262	493,830	99,237	106,676	73,152	1,718,960	221,881

* Population of San Blas is included in that of Colon.

Note: The figures from 1995 are projection of population.

Source: GCO

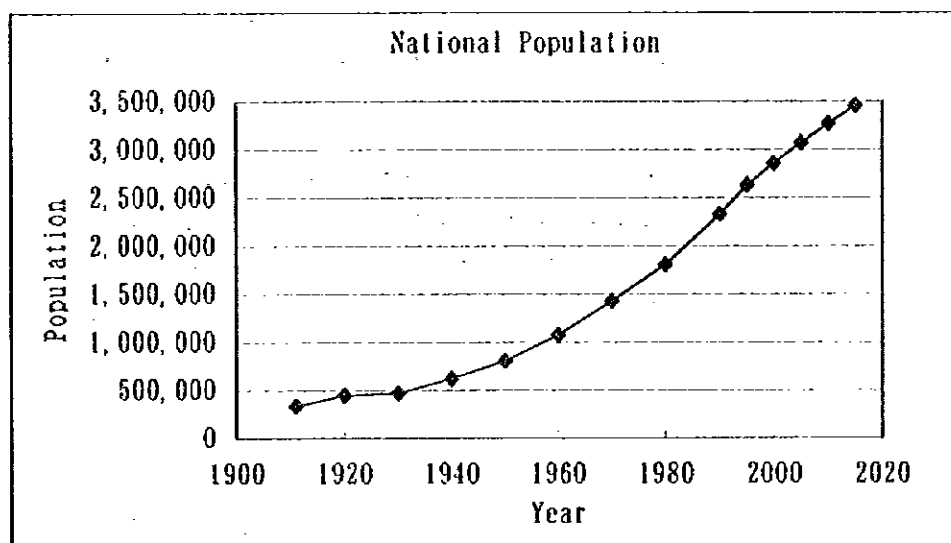


Figure 1-2-1 Population of Panama

1.2.2 Gross Domestic Products

11. The general trend of the gross domestic product (GDP) of industrial sectors in Panama is shown in Table 1-2-2, Table 1-2-3, and Figure 1-2-2. As shown in the tables and figure, the GDP sharply fell in 1988 and 1989 when the United States imposed economic sanctions and intervened in militarily. Since that, however, the GDP began to grow again and it exceeded its 1987 level in 1991.

12. Among the industrial sectors, the bank and insurance sector, the commerce sector, and the transport and communication sector have large shares of 27%, 22%, and 14% respectively. The total share of the three sectors accounts for more than 60% of the all industry.

13. Since the land area of Panama is not large and Panama does not have enough domestic capital, they have had to introduce foreign investment and have created distribution and finance centers making utmost use of its strategic geographical position to serve as a bridge between Central and South America and to join the Atlantic and Pacific Ocean for trade exchange and tourism. The Colon Free Trade Zone and International Finance Center opened in 1953 and 1970 respectively, and they are typical examples symbolizing such a situation. That is why the above three sectors have large share of the GDP.

14. On the other hand, the primary and the secondary industrial sectors such as the Agriculture sector, Manufacturing sector etc. are all weak. As of 1995, the share of Agriculture, Forestry and Fishery sector was only about 10% of the total. The share of Manufacturing is also low, with 12%, and the Mining sector is close to 0%.

15. The general trend of the GDP and GDP per-capita in Panama is shown in Table 1-2-4. As same to the trend of the GDP of industry, the GDP per-capita sharply fell in 1988 and 1989 when the United States imposed economic sanctions, and then the GDP per-capita began to grow again and reached US\$ 2,154 in 1994.

Table 1-2-2 Gross Domestic Products of Industry at Current Price

Unit: Million of US\$

Year	Total of All Industry	Agricul. L. Stock Fishery	Mining	Manufacturing	Electr., Gas & Water	Construction	Commerce Restaur. & Hotel	Transpt. & Communi.	Bank, Insur. & Business	Others
1986	4,922.5	483.7	4.7	614.7	234.5	203.0	886.0	829.2	1,381.8	284.9
1987	4,946.1	491.3	5.7	590.0	240.9	196.2	952.3	861.3	1,318.7	289.7
1988	4,262.5	455.7	3.3	453.0	247.2	93.9	815.5	786.0	1,133.0	244.9
1989	4,319.5	488.1	2.2	416.0	263.8	56.7	1,003.0	745.6	1,016.9	267.2
1990	4,818.8	503.8	3.5	502.2	214.0	58.4	1,199.9	847.2	1,210.4	279.4
1991	5,300.5	525.3	5.8	569.7	237.6	147.8	1,338.9	886.5	1,310.6	287.3
1992	6,058.3	539.7	10.2	621.0	228.1	217.3	1,637.7	939.4	1,559.4	305.5
1993	6,427.1	561.3	13.6	641.4	276.9	309.6	1,746.5	970.1	1,598.6	309.1
1994	6,775.1	567.2	15.4	672.9	278.6	327.2	1,878.7	1,003.0	1,704.7	327.4

Source: GCO

Table 1-2-3 Gross Domestic Products of Industry at 1982 Constant Price

Unit: Million of US\$

Year	Total of All Industry	Agricul. L. Stock Fishery	Mining	Manufac turing	Electr. , Gas & Water	Constr uction	Commerce Restaur. & Hotel	Transpt. & Communi.	Bank, Insur. & Business	Others
1986	4,385.9	431.3	1.4	481.4	219.3	177.8	849.5	681.4	1,267.1	273.7
1987	4,505.8	453.5	5.4	511.5	212.7	161.3	851.3	697.2	1,328.6	278.3
1988	3,715.3	421.1	3.1	398.9	228.8	77.6	655.7	638.5	1,053.0	235.5
1989	2,977.8	418.1	2.1	404.1	229.1	46.3	67.6	620.8	907.4	252.3
1990	3,993.6	455.0	2.9	459.8	230.5	51.6	831.4	610.3	1,052.0	267.1
1991	4,248.5	459.9	4.6	507.9	217.2	126.6	956.3	657.1	1,067.8	251.1
1992	4,691.8	480.2	7.1	554.1	203.3	173.1	1,073.7	681.3	1,252.4	266.3
1993	4,874.1	480.4	8.3	589.5	240.0	243.2	1,114.2	657.9	1,271.5	269.1
1991	5,127.0	495.5	9.1	614.6	251.9	248.6	1,165.9	678.8	1,380.4	282.2
1995	5,277.2	513.1	8.6	615.8	264.8	251.8	1,159.4	731.4	1,411.9	293.4

Source: GCO

* The figures in 1995 are preliminary and may change.

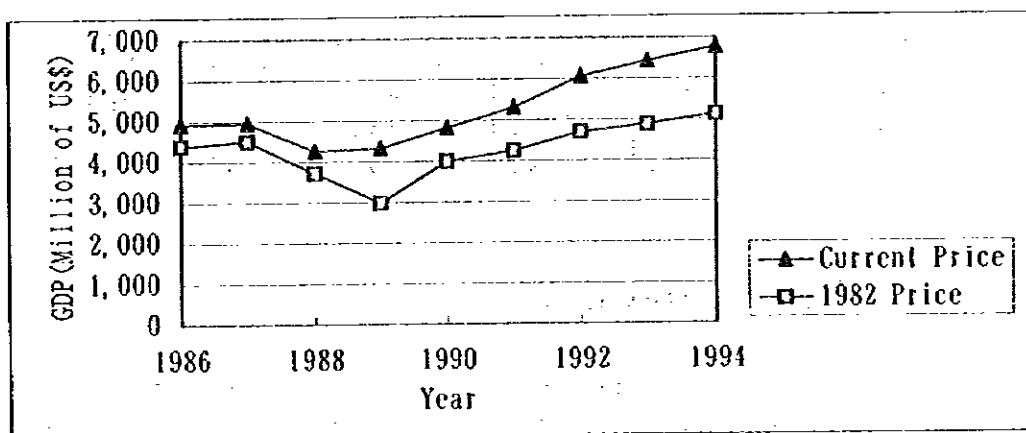


Figure 1-2-2 Gross Domestic Products of Panama

Table 1-2-4 GDP and GDP Per-capita at 1982 Constant Price

Year	GDP (Million of US\$)	GDP per-capita (US\$)	Growth Ratio of GDP per-capita
1985	4,467.7	2,061	n.a.
1986	4,667.1	2,110	2.4%
1987	4,808.2	2,131	1.0%
1988	4,175.9	1,813	-14.9%
1989	4,143.8	1,761	-2.7%
1990	4,451.1	1,857	5.3%
1991	4,803.2	1,966	5.9%
1992	5,149.9	2,070	5.3%
1993	5,363.0	2,116	2.2%
1991	5,562.1	2,151	1.8%
1995	5,670.3	2,155	0.0%

* The figures in 1995 are preliminary.

Source: GCO

1.3 Socio-economic Characteristics and Policy

1.3.1 Economic Activity

(1) Economic Activity of the Government

1) Fiscal Balance of the Central Government

16. Table 1-3-1 shows the financial balance of the Central Government. It is running a deficit, as is every country of South and Central America. However, the deficit has been gradually decreasing.

Table 1-3-1 Financial Balance of the Central Government
(comparison of GDP)

Year	1988	1989	1990	1991	1992
Revenues	13.2	12.4	19.5	19.9	21.4
Expenditure	24.9	26.0	24.7	24.2	24.6
Balance	-11.7	-13.6	-5.2	-4.3	-2.8

Source: IMF

2) Revenues of the Central Government

17. Table 1-3-2 shows the change of the revenues of the Central Government from 1991 to 1993. Total revenues have been fairly stable, ranging from 1.5 to 1.6 billion Balboas during the period. The tax revenues made up a great portion of the total (57.1%).

18. The non-tax revenues represented 31.0% of the total in 1993. The canal toll which is counted as non-tax revenue was 14.6% of all non-tax revenues in 1993. It was one of the main non-tax revenues. The naval license represented only 0.1% of non-tax revenues.

Table 1-3-2 Revenues of the Central Government

(1,000 B/.)

Year	1991	1992	1993
Total	1,605,607	1,611,336	1,505,159
Current Revenues	1,078,454	1,226,659	1,351,982
Tax Revenues	731,364	827,396	860,939
Non-tax Revenues	331,060	391,920	467,349
(Transfer from Public Company)	73,859	141,238	186,053
(Canal Toll)	65,214	64,536	68,254
(Naval License)	1		554
Balance of Bank & Cash	131,974	68,282	86,123
Capital Revenues	395,179	316,395	67,054
(Credit Resource)	158,234	93,754	25,245

Source: GCO

3) Transfer from Public Company

19. The transfer from public company was the most important non-tax revenue representing 39.8 % of non-tax revenues in 1993.

20. Table 1-3-3 shows the funds transferred from public companies from 1991 to 1993.

Table 1-3-3 Transfer from Public Companies

(1,000 B/.)

Year	1991	1992	1993
TRANSFER FROM PUBLIC COMPANIES	73,859	141,238	186,053
National Port Authority	1,869	10,062	8,200
Chiriqui Citric	207		
Sugar Corporation La Victoria	6,727	1,037	4,000
Division of Metropolitan Cleaning			1,000
Division of Civil Aeronautic			1,000
State Enterprise Cement Bayano	2,636	5,927	7,450
Agriculture Marketing Institute			2,000
National Telecommunication Institute	55,479	105,679	145,522
Hydraulic & Electrification Resources Inst.		7,069	7,000
Colon Free Zone	6,941	11,464	9,881

Source: GCO

4) Expenses and Debts of the Central Government

21. Table 1-3-4 shows the expenses of the Central Government in 1994. The

share of current expenses was 91% of the total while that for investment expenses was only 9%. The amortization and interest expenses were three times the investment expenses.

Table 1-3-4 Expenses of the Central Government (1994)

Unit	Current Expenses	(Amortization & Interest)	Investment Expenses
(Million B/.)	1,429.7	449.3	141.1
(%)	91.0	28.6	9.0

Source: GCO

22. The total amount of the debt including the unpaid interest of the National Government was 74.4 billion Balboas as of December 31, 1994. Repayment of private debt (about 60% of all foreign debt) has been stopped since 1987.

5) Structural Adjustment

23. The National Government must make structural adjustments to meet the terms set by the World Bank or other International Financial Institutions. The main disbursing terms which the World Bank set out in 1993 are as follows.

- a) To control the payment of the public service
- b) To restructure the telecommunications, power, waterworks and port sectors.
- c) To put the public companies under the private management
- d) To ease the protective policy of the domestic industry
- e) To reform the social insurance system

(2) Foreign Trade

1) Balance of Current Account

24. Table 1-3-5 shows the balance of the current account in 1993 to 1995. The current account was in the red during this period. The balance of trade was also in the red.

25. The balance of invisible trade was also in the red in 1993 and 1994. Most of the invisible trade derived from activities of the Colon free zone and international financial center. The income of the Canal contributed to the positive influence of its balance. The balance of invisible trade showed a surplus in 1993, because the income from passenger services and the petroleum and other oils increased.

Table 1-3-5 Balance of Current Account

(1,000 B/.)

Year	1993	1994	1995(p)
Balance of Current Account	-573,855	-519,031	-586,845
Balance of Trade	-547,669	-536,498	-924,931
Export (FOB)	5,333,612	5,916,501	5,972,376
Import (FOB)	-5,881,281	-6,452,999	-6,897,307
Balance of invisible Trade	-296,933	-203,057	110,656
Freight, Insurance	-673,380	-772,121	-762,987
Transport	561,737	594,981	723,378
Travel	103,158	112,254	182,887
Investment income	-711,207	-555,863	-453,466
Other	422,180	417,692	420,844
Balance of Transfer Account	271,326	220,524	227,430

(p): Provisional

Source: GCO

2) Export

26. The export value was 5.9 million Balboas in 1994. The main export goods were bananas (39.6% of the total) and shrimps (11.2%). Major trade goods of Panama are limited to primary products.

27. Of the total exports, 34.6% went to the United States.

3) Import

28. The total import value was 5.9 million Balboas in 1993.

29. The United States has the highest share as in imports, representing 36.5% (CIF) in 1993. It is notable that Panama imports from its Free Trade Zone, which has the second highest share of 16.6% in 1993.

(3) Prices

1) Consumer Prices

30. Price stability is an important objective of macro economics. Table 1-3-6 shows the rate of increase of consumer price from 1987 to 1995. The trend is quite stable. Because the US dollar is the currency in circulation, Panama has not suffered from the high inflation experienced in other South and Central American countries.

Table 1-3-6 Increase Rate of Consumers Price

year	1987	1988	1989	1990	1991	1992	1993	1994	1995
Rate (%)	1.0	0.6	0.1	0.8	1.3	1.8	0.5	1.3	1.2

Source: GCO

2) Controlled Price

31. The National Government has controlled the price of certain foods and other necessities since 1969. Formerly, approximately 150 items were subject to price controls, but as of June 24, 1996, the figure has dropped to 18.

(4) Employment

1) Composition of Employment by Industrial Sector

32. Table 1-3-7 shows the employment share by industrial sector. This table shows that the shares of both Transport/Communication sector and Bank/Insurance sector are low in comparison with GDP, showing shares of only 7.4% and 5.4% respectively in 1995. On the other hand, the share of the Agriculture sector seems to be high, with 19.7% in 1995.

Table 1-3-7 Employment Share by Industrial Sector

Year	1991	1992	1993	1994	1995(P)
Primary Industry	27.4	25.2	23.2	20.1	21.0
Agriculture, Livestock	26.2	24.3	22.3	19.1	19.7
Forestry, Fishery	1.1	0.7	0.8	0.8	1.0
Mining, Quarry	0.1	0.2	0.1	0.2	0.3
Secondary Industry	13.1	15.6	16.4	17.1	16.7
Manufacturing	9.5	10.2	10.3	10.8	10.5
Construction	3.6	5.4	6.1	6.3	6.2
Tertiary Industry	59.5	59.2	60.4	62.8	62.3
Electricity Gas Water	1.2	1.2	1.1	1.1	1.0
Commerce, Restaurants, Hotels	19.5	19.6	19.8	20.9	20.6
Transport, Communication	7.1	6.4	7.3	7.3	7.4
Financial, Insurance, Business	4.1	4.7	5.1	5.5	5.4
Public sector, Social Service	21.2	20.2	20.4	21.0	21.1
Other	6.4	7.1	6.7	7.0	6.8

(P): Provisional Data

Source: GCO

2) Unemployment

33. Table 1-3-8 shows the unemployment rate and number of unemployed. It shows that the unemployment rate was high in 1988 and 1989, when the United States imposed economic sanctions and executed military intervention. After that it has recovered slightly, but the level in 1995 was still high.

Table 1-3-8 Unemployment in Panama

Year	1988	1989	1990	1991	1992	1993	1994	1995
Number	127,767	133,708	-	135,952	134,353	124,718	135,468	138,232
Share(%)	16.3	16.3	-	16.0	14.7	13.3	14.0	13.7

(P): Provisional Data

Source: GCO

1.3.2 Industrial Activity

(1) Agriculture

34. The share occupied by the value added of the agricultural production in GDP was 18.0 % in 1994. Table 1-3-9 shows the composition of the value added of agricultural production. Fruits, nuts and spices represented the greatest part of this total value added.

Table 1-3-9 GDP from Agriculture Sector (1982 Price)

(million B/.)

Year	1993	1994	1995(P)
Agriculture	275.6	284.9	278.7
Cereals and Other products	82.9	84.7	85.4
Vegetables, Horticulture, etc.	18.0	18.4	19.0
Fruits, Nuts, Spices, etc.	158.5	165.9	158.3
Agriculture Service	16.2	15.9	16.0

(P): Provisional Data

Source: GCO

35. The major agricultural products of Panama are banana, sugar cane and coffee. They are also the major and most important exports of Panama.

a) Banana

Banana is the most important export good which is exported mainly to Germany and Italy. "Chiriquí Land Company" which is a private banana production company produced about 70% of the total products in 1993.

b) Sugar Cane

Sugar is also a major export good, most of which is exported to the United States. The main office of the national company, "La Victoria Sugar Company" is located in Veraguas Province.

c) Coffee

Chiriqui Province is the major coffee producing district of coffee, accounting for about 70% of total production. Coffee is also a major export good, almost all of which is exported to the United States.

(2) Manufacturing

36. The share of real GDP (1982 price) of Manufacturing sector was only 12.0% in 1994, mostly because of its small domestic market. The Manufacturing sector can therefore hardly pursue the scale merit.

37. Table 1-3-10 shows the composition of the real production from the manufacturing sector. Food processing had the largest share.

Table 1-3-10 Real Production from Manufacturing Sector (1970 price)
(million B/.)

Year	1991	1992	1993	1994(P)
Manufacturing	188.3	203.6	217.8	227.7
Food processing	65.4	69.6	72.9	72.4
Beverage products	33.5	34.1	35.9	37.1
Tobacco processing	4.9	5.0	5.7	7.5
Fiber products, Clothing	16.7	17.7	18.5	18.8
Furniture, Wood production	4.4	4.9	4.8	4.8
Paper, Paper products	10.1	10.3	10.6	13.3
Editing & Printing products	4.7	5.5	5.9	6.7
Chemical products	16.8	18.6	20.0	21.1
Petroleum refinery products	3.5	5.5	5.0	3.0
Plastics & mineral products	16.9	20.0	24.0	27.4
Metallic mineral products	6.4	7.1	7.9	8.4
Other	5.0	5.3	6.6	7.2

(P): Provisional Data

Source: GCO

(3) Commerce, Restaurants and Hotels

38. The share of real GDP (1982 prices) of the sector of commerce, restaurants and hotels was 22.7% in 1994. It was the second largest sector in the Panamanian economy.

39. In Panama visitors from outside of the country can enjoy a wide variety of shopping for foreign commodities at the Colon Free Trade Zone in particular. Among them, high-grade commodities are available at lower prices thanks to the tax system of this country. Therefore, many shopping tourists visit Panama from the countries around the Caribbean Sea or Middle American Countries. Tourism is thus a big factor for the national economy.

40. Table 1-3-11 shows the composition of the real production from the sector of commerce, restaurants and hotels.

Table 1-3-11 Real Production from Commerce, Restaurants and Hotels
(1970 price)

(million B/.)				
Year	1991	1992	1993	1994 (P)
TOTAL	241.3	260.9	275.0	284.4
Wholesale trade	88.1	92.4	96.9	101.9
Retail trade	116.1	128.5	136.5	139.8
Restaurants & Hotels	37.1	40.0	41.6	42.7

(P): Provisional Data

Source: GCO

(4) Financial Business

41. The share of real GDP (1982 price) of the sector of the bank, insurance and business was 26.9% in 1994. It was the largest sector in the Panamanian economy.

42. The international financial center was inaugurated in 1970. The National Government gave favorable treatment to levy the trading tax of the offshore fund in the center.

43. Table 1-3-12 shows the current balance of the international financial center from 1990 to 1992. The total assets, credit and deposit increased steadily during the period. The share of the external deposit was twice that of the internal deposit.

Table 1-3-12 Current Balance of the International Financial Center
(December 31)

(million B/.)

Year	1990	1991	1992	1993	1994	1995 (P)
Total Assets	18,384	20,682	23,034	26,078	32,807	33,842
Total Credit	10,976	11,628	13,503	15,776	18,758	20,941
Total Deposit	15,072	17,119	19,006	21,251	26,006	26,204
Internals	4,243	5,446	6,421	7,534	8,726	9,611
Externals	10,829	11,673	12,585	13,717	17,280	16,593

(P): Provisional Date

Source: CBN

1.3.3 Other Socio-economic Conditions

(1) Wages

44. Table 1-3-13 shows the change of the monthly salary from 1960 to 1995. The salary of the canal area was four times larger than the salary of other sectors in 1995.

Table 1-3-13 Change of Monthly Salary

(B/.)

Sector	Private	Public	Canal Area
1960	113.33	116.70	162.34
1970	177.30	184.05	399.47
1980	336.69	326.29	1,036.22
1991	388.33	458.07	1,741.25
1995	491.49	513.67	2,351.15

Source: GCO

45. A legal minimum wage system has been in effect since 1960. The current minimum wage in Panama city is as follows.

Agriculture	0.69 B/. per hour
Manufacturing	0.94 B/. per hour
Construction	1.25 B/. per hour
Commerce	0.94 B/. per hour
Transport	1.00 B/. per hour
Financial Business	1.00 B/. per hour

(2) Unequal Distribution of Income

46. According to a World Bank report issued on July 20, 1995, the Panamanian economy has very distinct characteristics, as a result of the so-called "dual economy".

47. The main sectors of the Panamanian economy highly contribute to the GDP, especially exports, but generate a small number of jobs. For example, the Colon Free Zone (ZLC) represents 8% of GDP, but only 1% of manpower.

48. The World Bank report states:

"Despite Panama's relatively high per capita income, two-fifths of the population live in poverty. Two-thirds of the poor reside in the countryside, and over one-half of rural Panamanian live in poverty. The distribution of income is highly skewed and has become much more regressive in the past decade. In 1979, the poorest 20% of the population received 4% of income, in 1989, that share had plunged to 2%. In 1989, Panama had one of the most unequal distributions of income in the hemisphere. Moreover, in 1989 the average real income of poorest 40% of the population was one-third lower than 1979."

(3) Economic Influence of US Military

49. According to the treaty of the Panama Canal, all US military personnel will withdraw in 2000. The number of soldiers and civilians has been gradually decreasing; there were 7,500 soldiers in Panama as of December, 1995.

50. In 1994, economic influence of the US military was as follows. At that time, there were 10,500 military personnel stationed in Panama.

- a) Net income of the Panamanian worker paid by US military is 94 million Balboas
- b) Expenses of USA military in Panama amounted to 61 million Balboas.
- c) Goods and services sold to the US defense department in the Panama Canal Area had a value of 149 million Balboas.

1.3.4 National Development Plan

(1) Contents of the Plan

51. The government of the President of the Republic Pérez Balladares approved the National Development Plan called "Public Policy for the Integral Development : Social Development with Economic Efficiency" in September 1994 for the years 1994-1999 equivalent to the present presidency.

52. This guideline shows the basic economic development policy of the government for the present presidency and consists of the following items;

1) Main actual socio-economic problems and their causes 2) Objective of the program 3) Nature of the economic policy from the viewpoint of the government 4) Economic and social policy 5) Specific proposal 6) Results expected, and 7) Conclusion.

(2) Outline of the Policy Related to the Port

53. What follows is an outline of the Policy related directly or indirectly to the ports.

1) Main Actual Socio-economic Problems and their Causes

a) Problems

• Employment

54. An average rate of unemployment is as follows;

1970~79	7.3 %
1982~89	11.9 %
1991~93	14.2 %

Note)not included semi-unemployment

• G.D.P.

55. An average rate of economic growth shown in G.D.P.(Gross Domestic Product) is as follows;

1951~60	4.0 %
1960~69	7.7 %
1970~79	3.8 %
1980 ~89	2.1 %
1990~93	6.9 %

56. The speed of the real growth of production of the country has gone slow down after '60s. In '90s the pace of the growth also has descended after the high level of 1991(9.3%).

- Competitiveness

57. The Panamanian economy is not competitive internationally because of production costs, which impede the export of the products of the majority of manufacturing industry and of a large part of agriculture, and affect even the competitiveness of services. The lack of competitiveness explains also the lack of direct foreign investment to Panama. The index of global economic productivity of each decade from 1950 is as follows;(1950~60=100.0)

1950~60	100.0 %
1960~70	129.9 %
1970~80	55.5 %
1980~90	32.6 %

- Inadequate Legal Scheme

58. It is indispensable to introduce substantial modification of the existing legal scheme for the purpose of making viable the reforms proposed in this Program.

b) Causes

- Inefficiency of the economy

59. Panama uses resources very inefficiently. It is necessary to invest much more than others countries to generate a unit of production(To create 100,000 work posts requires an investment of B/3,000 millions). The productivity of labor is also very low, which raises labor cost for each production unit, causing lack of competitiveness.

60. In Panama, the production factors--capital, labor, and land--are idle in a great portion. The problem is not of quantity of factors, but is of inadequate policies for utilizing resources up to date.

- Expensive Public Services

61. In terms of international comparison, electricity, telephone, water, and port are excessively expensive and inefficient. The increase of costs in the productive activities affects seriously the competitiveness.

2) Objective of the Program

62. It is fundamental to increase the level of competitiveness and productivity of the system, through the elimination of economic distortions, reorienting the economy abroad and redefining the role of the public sector, in order to convert it into a facilitator and make the activities of the private sector more efficient.

63. Part of financing necessary for certain works of infrastructure will be obtained by giving concessions to the private sector through direct administrative concession mechanism or BOO(build, operate, own) system, or BOT(build, operate, transfer) system.

3) (Omission)

4) Economic and Social Policy

a) Policy of Reform to the Public Administration

64. Central government and decentralized public sector will be reorganized based on the new role of the State, modernizing the procedures and systems of management , which will permit the efficient public services.

b) Policy of Restructure of the Public Enterprise

65. One of the limitations that could hinder the improvement and competitiveness of the economy is due to inefficiency, little reliability and high cost of public service.

66. To solve these structural problems of the public service, various measures will be offered, such as administrative restructure, confer of concessions, contract of service with the private sector, and privatization. This requires the creation of regulatory organization for regulation of activities of each sector. In case of privatization, it will be applied to state enterprise whose activity is not direct competence of the State, taking into consideration its social implication.

67. Within the model which will be utilized to obtain major efficiency of the public enterprise, as to port:

The operation of the main ports should be contracted with operators of international experience, retaining the State the property of the installations and supervision of the operations as it is done in the majority of the modern

ports today.

c) Policy for the Use of the Reverted Areas

68. The use of the assets of the Reverted Areas through a rapid and clear process for production purpose is an essential requirement to obtain a major economic growth in a five year period. It is necessary to accelerate the execution plans that ARI needs to assign the majority of the assets. ARI will have a General Plan that requires a law to act in an effective form by the middle of 1996.

d) Labor Policy

69. The guarantee of the fundamental rights of labor universally accepted is the angular stone of this subject. The purpose of labor policy consists of creating the necessary labor market conditions to achieve a high level of employment, having a legislation that is competitive with other countries which also try to attract foreign investors, and obtaining high level of productivity which strengthens the international competitive position of Panama.

70. The attainment of these objectives is essential for modernization of the economy and to overcome unemployment. Labor legislation should be modified in a short term.

e) Tourism Policy

71. This industry, adequately developed, will have a capacity of generating various hundred millions balboas of additional income in a few years. In a short time, it is necessary to eliminate the obstacles that make the development activities difficult, which include the entry requirements to Panama, air fare compared with others of competition, attention for the tourists received at arrival at the main international airports, cost conditions, convenience, and transportation security from airport to the city and lack of options, limited supply of rooms in first class hotels, and lack of adequate transportation for cruise passengers who transit the Canal.

72. To enhance the development activity, the State should invest in basic infrastructure, concentrating at the first phase in the areas with high potential of tourism. The preparation of an integral plan for tourism development will have priority.

f) Environment Policy

73. To secure the mechanism which guarantees that the development and economic growth do not affect the natural resources and environment.

5) Specific Proposal

74. In the economic area the strategy is intended to solve the problems which are identified, so as to take full advantage of the opportunities that the geographic position, the reverted areas, and the primary, secondary and tertiary sectors offer, that is;

- a) To remove simultaneously the double distortion of excessive capital incentives and inflexibility of labor.
- b) To eliminate protectionism, reducing customs tariff at a reasonable level gradually and coordinated with other measures, and also to abolish the quantitative restrictions to imports.
- c) To cut the price by reducing protection, controlling monopoly and oligopoly and liberating the price system.
- d) To eliminate the barriers to enter into certain activities.
- e) To make adequate the infrastructure to the needs of the country.

1.4 Transportation

1.4.1 General

75. Panama has been blessed with a strategic geographical position to serve as a bridge between Central and South America and to join the Atlantic and Pacific Ocean for trade exchange and tourism. For centuries, Panama attracted the interest of the United States and European countries because of its position. In 1855 the Panama-Colon Railroad was opened and the construction work of the Panama Canal was finished in 1914.

76. The Panama Canal is a great maritime artery that joins the Atlantic and Pacific Ocean. The ports of Cristobal and Balboa are located on opposite sides of the Panama Canal. Pan-American Highway, Panama-Colon Railroad, Tocumen International Airport, the Pipeline between Chiriqui Grande and Puerto Armuelles and other transport infrastructures have been constructed to support the national economy of Panama.

77. However, some of them, especially the ports and the railroad, need proper rehabilitation or new construction work as a result of insufficient maintenance and management.

78. The present conditions of road, railroad, airport and pipeline are illustrated in the following sections.

1.4.2 Road

79. Table 1-4-1 shows the length of roads in Panama. In Panama a total of 10,303 kilo-meters of roads are constructed and used. Their length has gradually increased in recent years. Pavement ratio is more than 30%. Among them, the central road which is a part of the Pan-American Highway and the crossing road which links the Cities of Panama and Colon are the most important. They are now two-lane roads except in some small sections.

80. Table 1-4-2 shows the number of registered cars in Panama, about 246 thousand in total. There has been increasing steadily in this number in recent years. In 1994, about 70% of registered cars were concentrated in the province of Panama, which lead to the traffic control of almost all streets by one-way in the city of Panama.

Table 1-4-1 Length of Road in Panama

Year	Total	(km)			
		Concrete Road	Asphalt Road	Dirt Road	Unpaved Road
1984	9,531.8	738.9	2,277.2	3,950.3	2,565.4
1985	9,693.7	729.2	2,422.1	4,078.8	2,463.6
1986	9,718.9	809.6	2,355.0	4,078.7	2,475.6
1987	9,715.7	810.9	2,373.3	3,982.1	2,549.4
1988	9,689.7	810.9	2,359.9	3,971.6	2,547.3
1989	9,781.4	799.1	2,346.5	4,077.9	2,557.9
1990	10,014.9	783.8	2,246.6	4,422.8	2,561.7
1991	9,956.3	783.5	2,420.1	3,904.1	2,848.6
1992	10,103.1	793.1	2,477.5	3,963.1	2,869.4
1993	10,146.3	793.1	2,523.8	3,985.5	2,843.9
1994	10,302.9	809.6	2,629.4	4,110.9	2,753.0

Source: Office of General Comptroller

Table 1-4-2 Number of Cars by Province

Province	1988	1989	1990	1991	1992	1993	1994
Total	186,201	173,904	186,943	206,239	213,734	231,338	246,498
Bocas del Toro	1,307	1,301	1,292	1,117	947	1,224	907
Cocle	6,572	6,772	5,945	7,051	7,180	7,688	7,578
Colon	11,221	11,449	11,405	12,387	12,742	13,797	13,369
Chiriqui	18,972	20,116	18,887	21,275	23,104	23,016	24,308
Darien	253	271	310	352	374	251	336
Herrera	6,113	5,483	6,268	6,713	6,893	7,417	7,750
Los Santos	6,107	6,951	6,823	7,072	7,710	7,281	8,292
Panama	118,588	106,637	122,930	135,178	141,012	155,505	169,806
Veraguas	5,568	5,414	5,007	6,037	6,483	6,961	6,783
Officials	11,550	9,500	8,076	9,057	7,289	8,195	7,369

Note: Official vehicles are not distributed by province.

Source: Office of General Comptroller

1.4.3 Railway

81. Panama has five railroad systems, including Panama-Colon Railroad which was transferred from the United States according to the Panama Canal Treaty. While there is the National Chiriqui Railroad and other local railroads, the Panama-Colon Railroad is the main railroad among them. This railroad running along the Panama Canal links the cities of Panama and Colon. The length of track is 80 kilometers with gauge of 1.5 meter.

82. Table 1-4-3 shows the total traveling distance and the number of passengers. The traveling distance and the number of passengers decreased drastically after 1987. At the end of 1989 the passenger traffic service had been stopped as a result of insufficient maintenance and management. In April, 1994, however, the passenger service for tourists was reopened in a certain section (Panama city - national park of Summit) on Sundays. The frequency of current cargo traffic service is around two times per day.

**Table 1-4-3 Number of Passengers and Traveling Distance
of Panama Railroad**

Year	Number of Passengers	Traveling Distance (km)
1986	129,049	189,795
1987	103,632	190,867
1988	44,636	132,113
1989	41,036	164,169
1990	-	-
1991	-	-
1992	-	-
1993	-	-
1994	42,670	8,340
1995	40,782	9,540

Source: Panama Railroad

1.4.4 Air Transportation

83. Role of airports in Panama is more significant than its road network. The number of airports totals 121 including 48 public airports. There are five international airports, but regular service lines call only at Tocumen International Airport.

84. Table 1-4-4 shows the number of passengers and cargo handling volume of Tocumen International Airport. The number of passengers, which was 900 thousand in 1989 through 1990, increased to around 1.4 million from 1989 to 1995. The cargo volume also increased steadily. It was around 68 thousand tons in 1995, though it was only 36 thousand tons in 1989.

85. Panama has two international airways companies, "COPA" (Compania Panama de Aviacion) and "Panama Air International". The latter is the former national airways "Air Panama International" which was commercialized in November 1991. It hasn't, however, started its operation yet.

Table 1-4-4 Number of Passengers and Cargo Volume of Tocumen International Airport

Description	1989	1990	1991	1992	1993	1994	1995
Passengers							
(Thousand persons)	902	901	1,016	1,089	1,192	1,313	1,385
Arrival	328	335	406	448	498	534	519
Departure	326	330	403	451	501	531	513
Transit	248	235	207	191	193	248	353
Cargo Volume							
(Metric tons)	36,337	38,015	44,582	61,089	62,236	73,509	68,519
Arrival	11,516	12,800	15,542	19,641	18,777	20,843	20,767
Departure	24,820	25,215	29,040	41,445	43,459	52,666	47,753

Source: Civil Aeronautics Bureau

1.4.5 Pipeline

86. In 1983, the Pipeline between Chiriqui Grande and Puerto Armuelles was opened. This pipeline was constructed to reduce the number of tankers through the Panama Canal which carry crude oil from Alaska to the East Coast of America. It is operated by "Petroterminal de Panama S.A.", a joint company of two American companies and the Government of Panama, the latter of which holds about 40% of the company's shares.

87. As shown in Table 1-4-5, the traffic volume of the pipeline has sharply decreased in recent years, because of the decrease of Alaskan oil product and the operation of the pipeline between California and Texas. In addition, it decreased dramatically last year, since Alaskan crude oil was permitted to export by the Government of the United States in 1995, under the condition of the use of the tankers registered in the country.

88. This company is supervised by the Board of ten directors, four of which are from the Government of Panama such as the minister of Planning, Finance or Commerce, with final decision making powers for the nation's interests resting with the office of the President of the Republic. APN is involved partially in receiving an annual payment up to one million dollars as the port service charge and supervising the water contamination. It is to receive additional 50 thousand dollars annually when

this company starts to handle the new dry cargo after the expansion in the near future.

Table 1-4-5 Traffic Volume of Pipeline

	1990	1991	1992	1993	1994	1995
Traffic Volume (thousand bbl.)	91,722	85,162	61,575	29,094	27,990	24,799
Income of the Government (thousand US \$)	10,467	9,946	7,405	3,778	3,596	2,815

Note: Statistics in calendar year

Source: Petroterminal de Panama S.A

1.4.6 Registration of Vessels

89. Panama plays the very important role in the registration of vessels among all parts of the world. The number and the gross tonnage have increased steadily since 1990, getting out of the direct influence of the economic sanctions imposed by the U.S. Government in 1980's. In 1993, it got ahead of Liberia in gross tonnage, finally to take the first rank of the world in both number and gross tonnage. In 1994, the vessels registered in Panama are 10,674 in number and 68,553 thousand in gross tonnage.

Table 1-4-6 Number and Gross Tonnage of Vessels Registered in Panama

Year	Total Number of Vessels	Total Gross Tonnage of Vessels
1988	9,654	46,194,652
1989	9,954	48,261,888
1990	9,482	45,292,822
1991	9,795	50,808,814
1992	10,254	55,490,037
1993	10,356	60,779,663
1994	10,674	68,386,577

Source: Office of General Comptroller

II OUTLINE OF PANAMANIAN PORTS

2.1 Ports Location and Major Functions

2.1.1 General

1. The Republic of Panama is geographically situated in an important position which connects the North and the South American Continents, and at the same time, separates the Pacific Ocean from the Atlantic Ocean. With the development of world maritime transport, Panama's geographical characteristics have attracted the world's attention and Panama has established itself as a key player in world maritime transport since the opening of the Panama Canal in the early 20th century.

2.1.2 Location of Ports

2. In Panama, there are twenty ports; ten ports on the Atlantic side, ten ports on the Pacific side as shown in Table 2-1-1. Of those, the National Port Authority (APN) controls seventeen ports, and the remaining (four ports) are owned and operated by private entities such as oil companies and a container terminal operator.

3. At the entrance of both sides of the Panama Canal, there are two major ports in Panama: the port of Balboa on the Pacific side and the port of Cristobal on the Atlantic side. Since both ports face a major international shipping route, they have great potential as commercial trade ports.

4. The Port of Balboa is located on the Pacific coast entrance of the Canal in the west of Panama City. The existing major facilities were constructed during the years 1914 - 1918 by the Panama Canal Company, just after the Canal was opened to world maritime traffic. When the Panama Canal was transferred under the administration of the Panama Canal Commission (PCC) according to the Panama Canal Treaties effectuated on 1 October 1979, the Port of Balboa was transferred to the Government of Panama and came under the administration of APN.

5. On the Atlantic coast, the Port of Cristobal is located west of Colon City on the east shore of Limon Bay. Existing major facilities of the port were constructed by the Panama Canal Company during the years 1914 - 1919. It was transferred to the Government of Panama in 1979 according to the Panama Canal

Treaties and came under the administration of APN.

6. There are two supplemental ports of APN to support the capacity constraint of the port of Cristobal: the port of Coco Solo Norte lying opposite the city of Colon, on the east side of Manzanillo Bay; and the port of Bahia Las Minas in the Las Minas Bay, east of Coco Solo. These three ports, located in close proximity to one another, form a port complex, sharing a common hinterland featuring the Colon Free Zone which is looked upon as the largest international free trade zone in the Western Hemisphere with a function of distribution center of industrial products to Central and South America.

7. In addition, the port of Manzanillo, operated by the Manzanillo International Terminal (MIT), is located on the south-east side of Manzanillo Bay, just on the south side of the port of Coco Solo Norte. It started its operation just in 1995. As well, the new terminal of Evergreen is under construction in the port of Coco Solo Norte. These two terminals were planned mainly as container transshipment centers on the Atlantic side of North and South America.

8. The locations of these ports are shown in Figure 2-1-1.

2.1.3 Major Functions of Ports

9. Among the 17 ports controlled by APN, there are 5 main ports (port of Cristobal, port of Coco Solo Norte, port of Bahia Las Minas (dry cargo), port of Balboa and port of Vacamonte) and the remaining 8 ports constitute secondary ports.

10. Major functions of Panamanian ports including ports for special purposes controlled by private companies are described below. Port classifications below are in accordance with the annual statistic report prepared by APN in 1995.

(1) Ports for Overseas Cargo

- 1) Cristobal, Coco Solo Norte, Bahia Las Minas (dry cargo), Manzanillo and Balboa

11. These five ports handle more than half of the total cargo handled in Panama and consequently, these ports are playing vital roles for Panamanian maritime activities. With the exception of Coco Solo Norte, these ports handle only overseas cargo. Excluding ports for special purposes, like handling banana and

Table 2-1-1 Ports in Panama

(Source: Autoridad Portuaria Nacional)

No.	Name of Port	Mayor Use	Administrator
	[Atlantic Side]		
1	Obaldia	Domestic Port	APN
2	Bahia Las Minas (dry cargo)	International Commercial Port	APN
	Bahia Las Minas (Oil Term.)	Oil Berth	RP
3	Coco Solo Norte	International Commercial Port	APN
4	Manzanillo	International Commercial Port	Vehicles and Containers
5	Cristobal	International Commercial Port	Containers
6	Chiriqui Grande (dry cargo)	Domestic Port	APN
7	Chiriqui Grande Terminal	Oil Berth	Crude Oil
8	Bocas del Toro	Domestic Port	General Cargo
9	Almirante	International Port for Banana	Fruits (Banana)
10	Almirante Terminal	Oil Berth	APN
	[Pacific Side]		
11	La Palma	Domestic Port	Wood and Plantain
12	Panama	International Port	General Cargo
13	Balboa	International Commercial Port	Containers, Grain
14	Taboga	Domestic Port	APN
15	Vacamonte	Fishery Port	Fish (Shrimp)
16	Aguadulce	International Port for Sugar	Bulk Cargo (Rice)
17	Mutis	Domestic Port	Bulk (Sugar)
18	Pedregal	International Port	Bulk (Sugar)
19	Armuelles	International Port for Banana	Fruits (Banana)
20	Charco Azul	Oil Berth	Crude Oil

Note: APN: Autoridad Portuaria Nacional

PTP: Petroterminal de Panama

RP : Refineria Panama

MIT: Manzanillo International Terminal

Balboa:	Lat. 8° 57' 00" N Long. 79° 34' 00" W
Cristobal:	Lat. 9° 21' 00" N Long. 79° 55' 00" W
Manzanillo:	Lat. 9° 21' 42" N Long. 79° 3' 5" W
Coco Solo: Norre	Lat. 9° 22' 00" N Long. 79° 53' 00" W
Bahia Las Minas	Lat. 9° 24' 00" N Long. 79° 49' 00" W

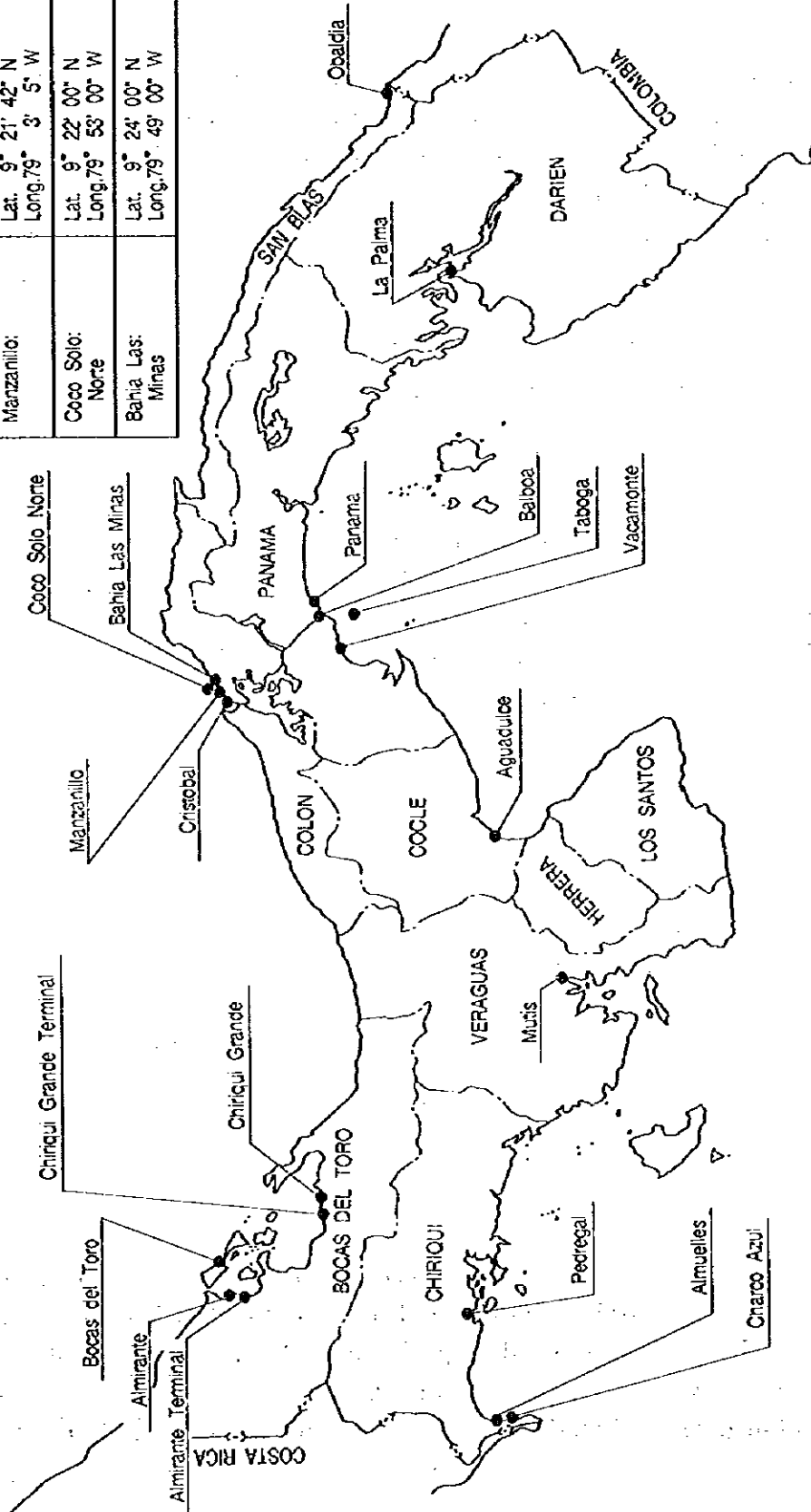


Figure 2-1-1 Locations of Ports in Panama
(Source: Autoridad Portuaria Nacional)

sugar, these five ports are handling most overseas cargo in Panama. The ports of Cristobal and Balboa are identified as a "Port Complex" according to the APN port classifications.

12. In 1995, at the port of Cristobal, the cargo volume handled was 1,198,811 metric tons and the number of ship calls was 1,228 (936 ships handled cargo); the port of Coco Solo Norte, 406,227 metric tons and 1,321 ship calls (1, 219 handled cargo); the port of Bahia Las Minas (dry cargo), 204,069 metric tons and 168 ship calls (121 handled cargo); and port of Balboa, 714,501 metric tons and 1,259 ship calls (385 handled cargo), respectively. The port of Manzanillo started its operation as private terminal in 1995. According to the statistics reported to APN, it handled a total of 103,801 containers and 38,791 vehicles (total 429 ship calls) in the year 1995. These ports will be stated in detail in following sections.

2) Pedregal

13. The port of Pedregal is located in the Chiriqui Province on the Pacific side. General cargo (sacked sugar, fertilizer, shrimp etc.) and bulk sugar are mainly handled in this port. The cargo volume handled was 31,886 metric tons in 1995 and has been increasing in these four years. The number of ship calls in 1995 was 255 (175 ships handled cargo).

3) Panama (Mulle Fiscal)

14. The port of Panama is located on the shore of the Panama Bay and classified as a port for overseas cargo, but more than 90% of the total cargo handled was for domestic trade. General cargo (loading) and agricultural products (wood, corn, banana; unloading) from the Darien Province are mainly handled at this port. The cargo volume handled was 21,642 metric tons in 1995. The number of ship calls in 1995 was 1,688 (1,399 ships handled cargo).

(2) Ports for Special Purposes

1) Vacamonte

15. The port of Vacamonte which was designed to serve the fishing activities in Panama is located 20 km south-west of the port of Balboa. The major cargoes handled at this port are tuna, shrimp, fish flour, fertilizer etc. Most cargo is categorized as overseas trade. All tuna is transshipped abroad. The cargo movement in 1995 was 13,601 metric tons. The number of ship calls in 1995 was

3,439 (2,876 ships handled cargo). Most ships handle tuna.

2) Aguadulce

16. The port of Aguadulce is situated in the Cocolé Province on the Pacific side. The major cargoes handled are sugar (33% in 1995) and fertilizer (64% in 1995) and the majority of both cargoes are handled in bulk. All cargo is for foreign trade. The cargo volume handled in 1995 was 93,790 metric tons. The number of ship calls in 1995 was 82 (62 ships handled cargo).

3) Almirante

17. The port of Almirante is located on the western side of the Almirante Bay in the Bocas del Toro Province (Atlantic coast). The major cargo handled is banana (87% of total cargo handled in 1995), of which nearly 100% is loaded for exportation. The cargo volume handled was 563,218 metric tons in 1995 and the past records indicate steady cargo handling in the last 10 years. The number of ship calls in 1995 was 777 (776 ships handled cargo).

4) Armuelles

18. The port of Armuelles is located in the Chiriquí Province on the Pacific coast, near the border with Costa Rica. The cargo volume handled was 376,205 metric tons in 1995 and the major cargo handled is banana for exportation like the port of Almirante on the Atlantic side of Panama. The number of ship calls in 1995 was 156 (107 ships handled cargo).

5) Bahía Las Minas

19. The terminal of Bahía Las Minas is located just north of the port of Bahía Las Minas (dry cargo) in the Colón Province on the Atlantic side of Panama. The major cargo handled is crude oil (57% of the volume in 1995) and the others are petroleum products. The Panama Refinery is located just behind the terminal.

6) Charco Azul

20. The terminal of Charco Azul is located in the Charco Azul Bay, Chiriquí Province on the Pacific side. There are three oil terminals exclusively used for unloading crude oil coming from Alaska. The crude oil is transferred to the terminal of Chiriquí Grande on the Atlantic side through the oil pipeline across

the Isthmus of Panama with a capacity of 100,000 barrels per minute. The crude oil handled and the number of ship calls in 1995 were 28,956 thousand barrels and 64 (an average gross tonnage of ships is 45,218 tons) respectively.

7) Chiriqui Grande

21. The terminal of Chiriqui Grande is situated on the Chiriqui Lagoon in the district of Chiriqui Grande, Bocas del Toro Province, on the Atlantic side. This port is one of the ports having the oil pipeline across the Isthmus of Panama and handling crude oil from Alaska. The crude oil handled in 1995 was 22,281 thousand barrels. The number of ship calls was 43 with an average gross tonnage of 37,376 tons in 1995.

22. Since the government of the United States permitted crude oil produced in Alaska to be exported in 1995, under the condition of the use of the tankers registered in the country, the crude oil handled in Panamanian ports decreased dramatically. The last tanker called the port of Charco Azul in January, 1995. The new project, therefore, is being carried out, the details of which are explained later.

(3) Ports for Domestic Cargo

1) Bocas del Toro

23. The port of Bocas del Toro is located in the Province of the same name on the Atlantic side. In 1995, 3,254 metric tons (most were unloaded) of cargo were handled. The major commodities are industrial products (diesel oil, cement, etc.). The main domestic ports of origin and destination are Coco Solo Norte and Almirante. The number of ship calls in 1995 was 194 (178 ships handled cargo).

2) La Palma

24. The port of La Palma is located in the estuaries of the Tuira River and Sabanas River which flow into the Gulf of San Miguel in the Darien Province. The cargo volume handled in 1995 was 89,853 metric tons. The major commodities handled are traditional agricultural products of the province; log, timber, corn, banana, etc., and most of them are loaded. The number of ship calls in 1995 was 683 (561 ships handled cargo).

3) Mutis

25. The port of Mutis is situated in the Gulf of Montijo on the Pacific side of the Veraguas Province. The cargo volume handled in this port was 219 metric tons. The major commodities are rice, fish, urea, etc. and most are unloaded. The number of ship calls in 1995 was 768 (622 ships handled cargo).

2.2 Port Facilities of the port of Balboa

2.2.1 General

26. The port of Balboa, constructed in the inlet at the Pacific entrance of the Panama Canal without breakwaters, has 12 wharves having a total length of 2,462 m and a dry dock complex consisting of three different size dry docks: the only such facility in Latin America. This port is located in the front of the city of Panama, the capital of the country. It connects with the port of Cristobal by road and train, and also the Pan-American Highway running through the country. It can operate 24 hours a day, 365 days a year with conditions attached.

27. The entrance of the Canal, which is common with the entrance toward the port of Balboa, is protected by a breakwater (Amador causeway). The access and berthing areas are maintained at the maximum draft of 12 m (40 ft).

28. Cargo handling (Bulk Cargo), tugboat, ship supply, ship repair, launch and other various services are offered by private companies through a number of concessions. However, pilotage, which is compulsory, is offered by the Panama Canal Commission (PCC).

29. Layout of the current Port of Balboa is shown in Figure 2-2-1. General characteristics of the port are shown in Table 2-2-1.

2.2.2 Port Area

30. Since the port of Balboa faces the Canal, the border of the port area (land and water) is set against the Canal area in a complex manner. In addition, the reverted area shall be considered.

31. Even within the current land area of the port, there still remains an exclusive area of the Canal facilities that belong to PCC for the operation of the

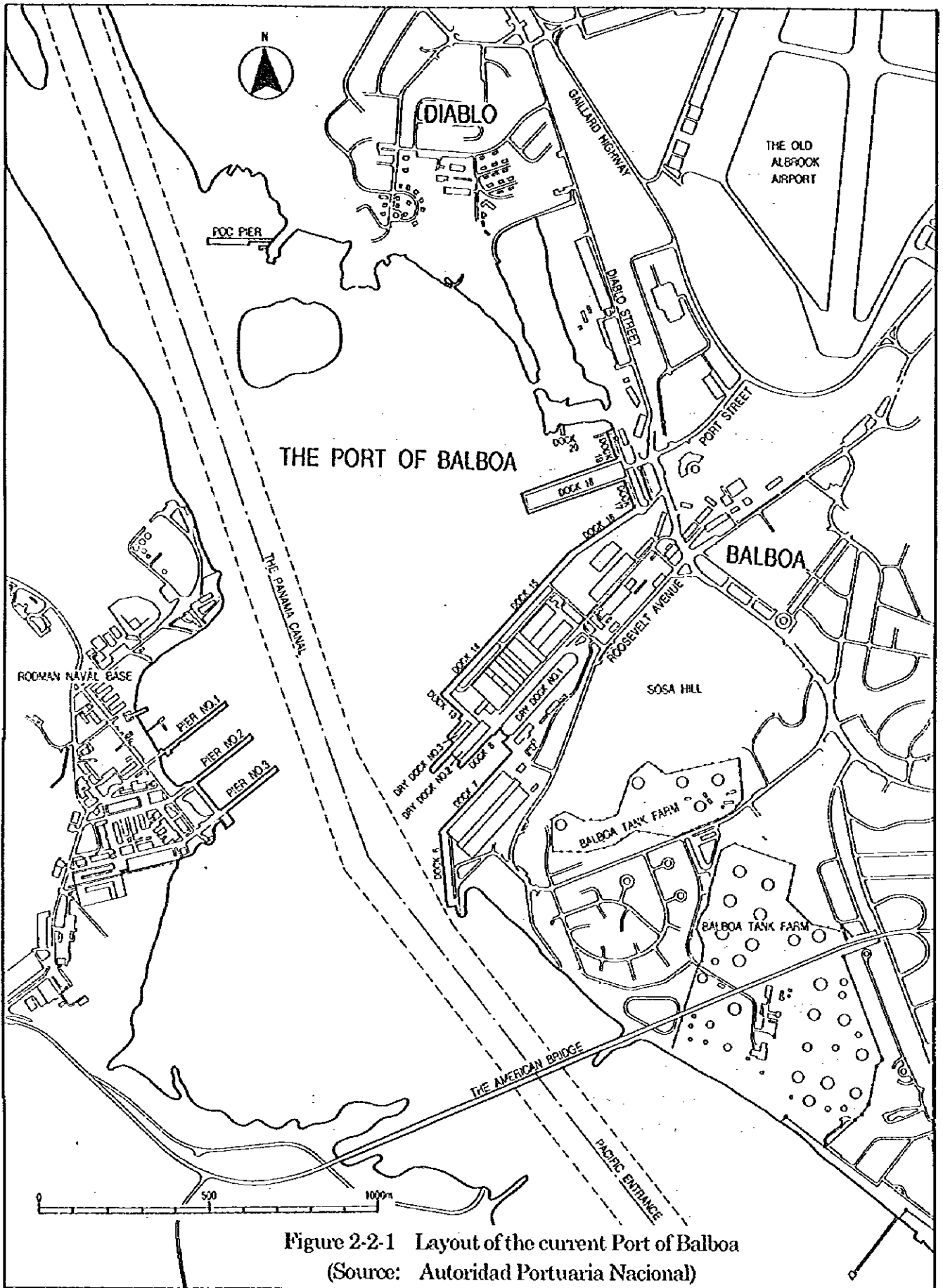


Figure 2-2-1 Layout of the current Port of Balboa
 (Source: Autoridad Portuaria Nacional)

Table 2-2-1 General Characteristics of the Port of Balboa
(Source: Autoridad Portuaria Nacional)

Pier No.	Dimension (m)	Mooring Length (m)	Maximum Ship Length (m)	Berth Depth (m)	Major Use	Ship Supplies	Remarks
6	226	226	213	9.2	grain, vehicle, bunker	water, bunker	grain handling equipment, bunker handling equipment, bunker tank
7	343	322	259	9.0-9.9	bunker, chemical product	water, bunker	bunker handling equipment, chemical handling equipment, bunker tank
8	143	143		8.5	(for dry dock)		
13	84	80			(for dry dock)	water	
14	236	236	236	9.3-9.5	grain, container, ship repair	water, bunker	grain handling equipment, tugboat, no container crane
15	352	349	305	9.7	container, vehicle	water, bunker	no container crane
16	223	223	183	9.5-9.7	container	water, bunker	no container crane
17	92	92	18	7.0	for launch, passenger ship	water	
18-S	305	305	305	10.2-12.0	general cargo	water, bunker	
18-W	64	59	58	7.5	for small ship	water, bunker	
18-N	305	305	289	8.6-9.5	general cargo, passenger ship	water, bunker	
19	89	88	18	8.0	launch (PCC)	water, bunker	
(total)	2,462	2,426	1,884				

Source: APN and PCC

Note 1: Berth Depth is measured at the distance of 5 meters from the berth as of February, 1995. Dredge in the front of principal piers was carried out in 1992, up to 10.7 meters (35 feet) at the distance of 5 meters, and 12.8 meters at the distance of 15 meters (42 feet) from the berths.

Note 2: Bunker C and light diesel oil is available for bunker service.

Canal. On the other hand, the part of the neighboring areas and the opposite areas across the Canal, which is to revert from the United States, will be available for the future expansion of the port in addition to the current land area. It is now under coordination of ARI (Autoridad Regional Interoceánica) with other various projects. The first priority shall, however, be placed on the port development. The current land use around the port will be described later.

32. The water area, generally speaking, is very limited. It is surrounded by the Canal waterway on the west side, by Piers No.6 to No.18 on the south to the east side, and by the land area and the mangrove in the front of the land area on the east to the north side. This area is used mainly for the port activities. From time to time, however, some relatively small vessels are temporarily staying near the waterway of the Canal waiting to transit the locks of the Canal.

33. Especially, the water area in front of Pier No.6 is the most limited, which can afford just one vessel between the Canal and the pier.

34. The area around No.7 to No.15 is also narrow with a width of less than 200 m. The use of the slip of 76 m (250 feet) width between Pier No.7 and No.8 and, at the same time, in front of Dry Dock No.1 is strictly limited, a minimum 46 m (150 feet) width of which has to be free based on the regulations of PCC, which seem to survive. That is, the total width of the vessels at Pier No.7 and No.8 is limited to a maximum 30 m (100 feet) at any time. It is desirable to employ the regulations more flexibly through coordinating the ship movements by use, in order to utilize the limited facilities.

35. In addition, the vessel at Pier No.7, even during cargo handling, must temporarily move away, when the vessel in Dry Dock No.1 is pulled out, according to the concession contract of 20 years signed in 1991 between Dry Dock and APN. The contract allows the Dry Dock use of Pier No.14, 15 and 16 as well (,but Pier No.15 and 16 are rarely used by the Dry Dock).

36. And the slip between Pier No. 16 and 18 is only 100 m wide and inconvenient for maneuvering the large size vessels of today. Around 200-300 m away from Pier No.18, two buoys are located for the small ships of up to 96 m length for ship repair, detention for maritime justice, etc.

37. There are no water rights and fishing rights around the port of Balboa, down to the south entrance of the Canal. Up to the north, the Miraflores Filtration Plant is located near the Miraflores locks of the Canal, which provides drinking

water to many vessels using the port of Balboa as well as the people around the Canal area.

2.2.3 Wharves

38. The wharves identified as No. 6 and 7 are continuous berths with open wharf type structure. Pier No.6 is used mainly for imported cargo such as grain (corn and soybean), vehicle and bunker; No.7, for bunker and chemical product. Pier No.6 is equipped with exclusive cargo handling facilities for grain (but no silos are installed); and Pier No.6 and 7 for liquid cargo. In addition several chemical tanks have been installed behind Pier No.7. At a slight distance from these piers, many bunker tanks, known as Balboa tank firm, are grouped together.

39. The wharves identified as No.14, 15 and 16 also form a continuous marginal wharf having a combined length of 811 m. These wharves are of prime importance to the operation of this port. Pier No.14,15 and 16 handle containers. Pier No.14 is used mainly for grain (wheat), containers and ship repair (for use of the dry dock); No. 15 mainly for container and vehicle; and No.16 mainly for containers. Pier No.14 is equipped with exclusive cargo handling facilities for grain (, but no silos are installed) in the same way as No.6.

40. The container handling is carried out by conventional equipment, ship winch, or Ro-Ro, since these piers are not equipped with exclusive cargo handling facilities for container. From 1981 to 1993, however, a 30 tonnage type Gantry Crane was equipped on Pier No.15 by the US line. The railway, not exclusive for container, is installed just behind these piers' head line. Container handling is described in detail later.

41. The wharves identified as No.17 is located at the interior of the port close to the main gate of it. It is used mainly for passengers. In addition to the launch service, liner services to the nearby island of Taboga are offered by 3 companies with 5 ships with capacities ranging from 75 to 600 passengers.

42. Pier No.18 is a finger type pier and the only facility in this port with a cargo shed. This wharf is used by the largest number of general cargo vessels and fishing boats working at Balboa. The cargo shed is 305 m by 49 m or total floor area of 15,000 m². It is now utilized as the storage space for empty container, vehicle, and general cargo, which can't allow of many full container because of structural instability.

43. The wharves identified as Pier No.19 is exclusively for the many small ships of PCC.

44. As well as cargo handling, ship repair and ship supply are of prime importance to this port. Almost all wharves offer bunker and water supply service. Bunker service is carried out by five oil tank companies of concessions while one company of concession manages the pump station and pipeline owned by APN. Water supply is carried out by APN. Ship repair is offered by several companies, one of which manages the dry dock complex through concession. The details are described later.

45. The areas behind the wharves are too narrow for cargo handling. This is because the port of Balboa was originally constructed not for cargo handling, but mainly to provide ship repairs and supplies to the vessels transiting the Canal. Generally speaking, the width of the cargo handling space behind the quay wall needs at least 100 m to 200 m for the general wharf, and more than 300 meters for the container terminal.

2.2.4 Priority of Ship and Wharf Assignment

46. The ship arrival shall be informed to APN more than 48 hours in advance. The berth assignment is determined 15 to 24 hours beforehand, after considering the kind of cargo, the availability of the storage yard, the ship draft, the tide and so on. The priority of the ship and the wharf assignment is generally as follows;

1. Passenger Ship (for Pier No.17 and 18 in order)
2. Cargo Ship
 - 2-1. Container Ship (for Pier No.16, 15 and 14 in order; close to the main gate)
 - 2-2. Grain Ship (for Pier No.6 and 14; related to the shipping company, which installed the exclusive cargo handling equipment respectively)
 - 2-3. Car Carrier (for No.15 and 6; close to the main gate and another gate)
 - 2-4. Oil Tanker (for No.6 and 7; where the exclusive cargo handling equipment is installed)
 - 2-5. Other Ship
3. Ship for bunker and water
4. Ship for repair

47. The ships calling the port of Balboa are assigned the tugboats by private

companies (shipping agencies), if necessary, between the American Bridge and the Miraflores lock of the Canal. There are two tugboats of 3,000 bhp in the port with concession, and further tugboats can be hired from PCC, if necessary.

2.2.5 Container Handling

48. As aforementioned, containers are handled at Pier No.14,15 and 16. However, there is no full scale container terminal in the port of Balboa. Now, vessels use their own or rented equipment for cargo handling. On the land side, the containers are located in vacant areas because there aren't sufficient yards for containers. As a result, many containers have to be carried in or out the port in the very short term, sometimes at the time of cargo handling. The maximum free staying time of containers in the port is five working days.

49. The container handling yard consists of very narrow space just behind Pier No.14, 15 and 16, where containers are stored almost in one line, the corner space of 1,500 m² behind Pier No.14, the rectangular area of 6,124 m² (common for the storage for vehicles as well) behind No.15, the area of 22,175 m² (old coal pit etc.) behind No.7 are being prepared, which amounts up to no more than 29,799 m². The cargo shed of Pier No.18 is also used for empty containers. This shed used to play the role similar to CFS before, but LCL cargoes are scarcely observed at this port now.

50. In addition to these areas, the total combined spaces of 21,154 m² behind No.16, which is to be coordinated with the function of railroad, narrow spaces of 10,498 m² behind the apron of No.14 and 15, an area of 13,910 m² behind No.7, and the triangle space of 9,057 m² near the dry dock can be planned for the expansion of the storage yard. These sum up to 54,619 m², which would result in an instant storage capacity of about 4,500 TEUs with an average stacking height of 2 containers. The areas for cargo storage related to container cargo are shown in Figure 2-2-2 and Table 2-2-2, where three major areas are also suggested as combined areas for future expansion.

51. The storage area behind Pier No.7, however, is far from Pier No.14,15 and 16 with containers being forced to go around the other port facilities. Now these containers are carried out the main port entrance, transported on the Roosevelt Avenue, and carried to the entrance near the storage area behind Pier No.7. Under some circumstances, in the very short term, the short cut through the land of PCC should be constructed, or priority for use of Pier No.7 should be given to container ships, which occupy the berth only one or two days, after coordination

with other ship assignments.

52. In connection with container yards, almost all of them are common for vehicles at present. The vehicles, however, seem to be handled more smoothly because they can be moved easily everywhere. They are almost all for domestic use, which are dealt with by several Panamanian companies. They are estimated to be carried out of the port in one or two days.

2.2.6 Grain Handling

53. Pier No.6 and 14 are assigned together to several grain importers equally and annually. Factories range from 0.5 to 4 hours in traveling distance from the port of Balboa. Several mobile pneumatic unloaders or shovel cranes are prepared there by these importers directly or indirectly. The former are used mainly for wheat at Pier No.14, while the latter are mainly for corn and soybean at No.6. They are rent to one another when necessary. The equipment is very simple, and there aren't silos behind the piers. The grain is, therefore, handled directly from one ship to several carrying trucks. It causes air pollution (dust and odor) easily, especially when using shovel cranes at No.6, and takes a lot of time (2 weeks per ship of 20,000D/W). This is why the piers, lying leeward, are assigned for grain as far as possible from human activities and PCC's computers behind Pier No.15.

54. In general, however, the importers seem to be almost satisfied with the current cargo handling at the port of Balboa in light of the priority of the ship and the capacity of their factories. If their activities at the port are assured permanently, they will determine to invest there more easily.

2.2.7 Bunkering facilities

55. As aforementioned, bunkering service has been one of the major functions of the port of Balboa since its establishment. It is offered directly at almost all the wharves, or by barges, which are operated by Panamanian companies, to the vessels calling the port and/or transiting the Canal. (The details will be explained in the later chapter.)

56. According to Chevron (one of major oil companies), the rate of the vessels transiting the Canal, which make use of the bunkering service at the port, is expected to increase from 22% in 1995 (9 among 42 ships) to around 50% recorded in 1970 (19 among 36 ships). It has been increasing steadily these several years, after it had decreased drastically because of the Panamanian political power

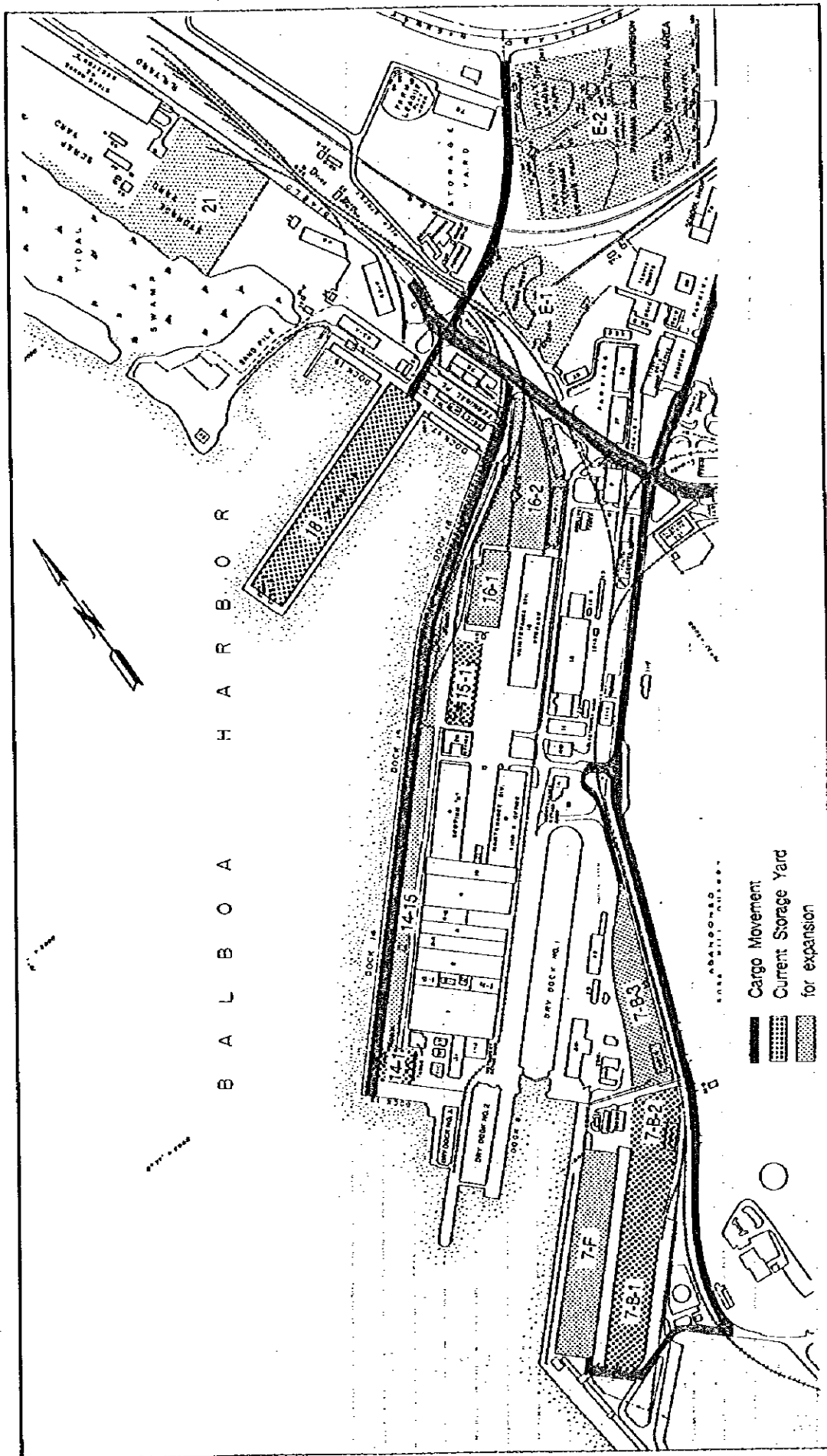


Figure 2-2-2 Layout of the Storage Yard of Containers
 (Source: Autoridad Portuaria Nacional)

Table 2-2-2 The Storage Yard of Containers
(Source: Autoridad Portuaria Nacional)

Storage Yard No.	Area (sq. meters)	Current Use related Container	Remarks
7-F	13,910	(container, vehicle)	for expansion (partially water)
7-B-1	14,475	container, vehicle	(old coal pit)
7-B-2	7,700	container, vehicle	paving just finished
7-B-3	9,057	(container, vehicle)	for expansion (rough land)
14-1	1,500	container	
14-15	10,498	(container)	for expansion (partially gutter)
15-1	6,124	container, vehicle	under paving
16-1	4,076	(container)	for expansion (workshop of railway cars)
16-2	17,078	(container)	for expansion (yard of old railway cars)
18	14,786	empty container, vehicle, general cargo	(old shed, instability of substructure)
E-1		(container)	for expansion (round house of railway cars)
E-2		(container)	for expansion (playing fields)
21	69,800	(container)	potential for expansion (storage yard of PCC)

change and the toll rise of the Canal. At present, opportunities to supply bunker oil to the vessels transiting the Canal are being lost unfortunately due to lack of sufficient available port facilities.

57. Regarding the future expansion of bunkering facilities, some alternatives can be examined, including the construction of the new pier in the front of the Balboa tank farm around the American Bridge on the east bank of the Canal, and/or the utilization of the facilities of the fuel storage tanks area at Arraijan and the Rodman Naval Base on the west bank of the Canal, which were made available for Panama in January of 1997.

58. In addition to bunker oil, water is supplied at the port. In 1995, 27,674 thousand gallons of water was supplied to the calling ships by APN.

2.2.8 Dry Dock Complex

59. The ship repair service is represented by the dry dock complex. The principal dry dock is the largest at 318 m in length, 33.5 m in width and 12.8m in depth, that is, almost the same size of the locks of the Panama Canal. Constructed on basaltic rock, it offers 10.7 m total depth and is equipped to service and re-launch vessels of up to 60,000 DWT (See Figure 2-2-3). There are also two other small docks. Dock No.2 is 134 m long, 25.5 m wide and 8.1 m deep. Dock No.3 is 72 m long, 15 m wide and 5.8 m deep. (The details will be explained in the later chapter as well as bunkering facilities.)

60. In 1991, the current company, Astilleros Braswell International S.A., established in Panama by an American made a contract with APN through concession of 20 years. Since then, this company has been increasing its performance by 30 % per year. It repaired 74 ships including 40 Panamax ships in 1995. Average stay of one ship in the dock is 8-10 days. According to the company, the capacity of this dry dock estimated at 85-105 ships per year will be saturated in 1997-1998. It intends to extend the activity to the Pier No.6 and 7 at the next stage.

61. Around the Pacific side of North and South America, there are scarcely such dry dock as this. To the north, the dry dock of the port of Los Angeles will stop operation in the near future. To the south, the dry dock of Chile is too far away to be convenient.

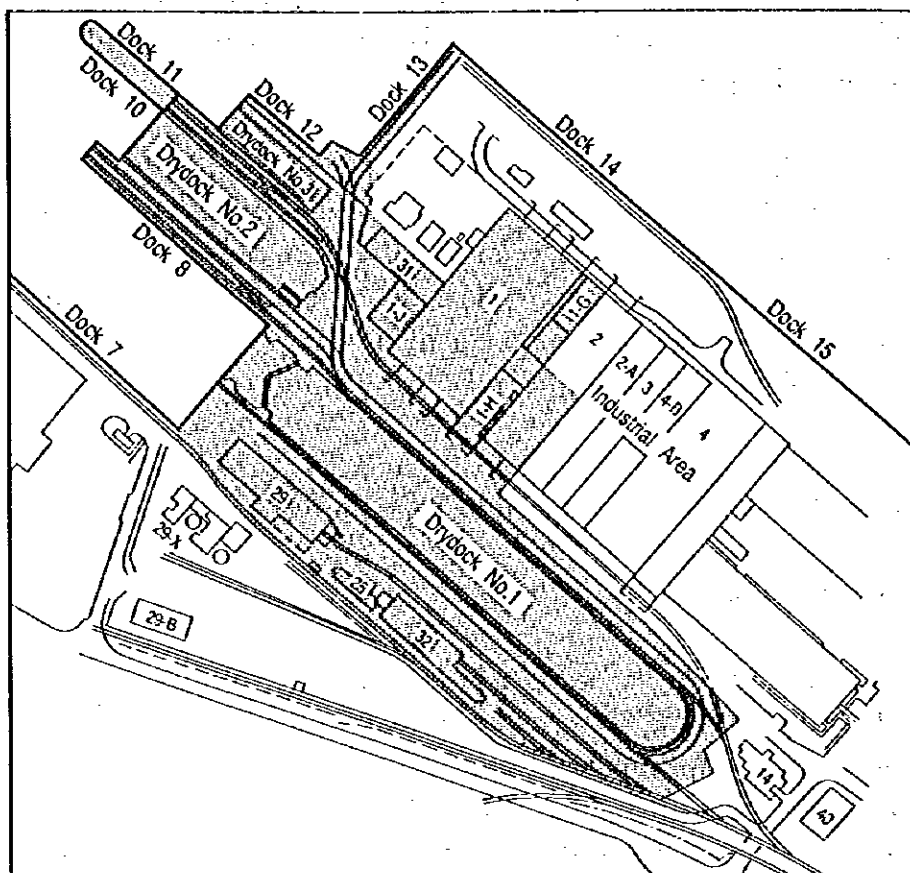


Figure 2-2-3 Dry Dock Complex in Balboa
 (Source: Autoridad Portuaria Nacional)

2.2.9 Preliminary Evaluation of Wharf Utilization

62. As a convenient methods to evaluate wharf utilization related to cargo handling, cargo movement per mooring length at the wharf can be calculated. For that purpose, at first, it is necessary to convert both cargo movement and mooring length on the certain basis described below.

(1) Cargo Movement

63. Taking note of the form of cargo, it shall be divided into two major classifications: general cargo and bulk cargo. The general cargo volume is the same (1) as it is, while the other dry bulk cargo volume converted to that of general cargo, or conversion factors of 1/2 to 1/10 according to the form of cargoes.

(2) Mooring Length

64. The converted mooring length to that of the wharf of deep depth shall be calculated based on the berth depth as follows:

	converting coefficient
more than 7.5 meters of the depth	1
from 7.5 meters to 4.0 meters of the depth	2/3
from 4.0 meters to 2.0 meters of the depth	1/3

(3) Convenient Index of Wharf Utilization

65. The convenient index of wharf utilization is calculated as follows:

$$\text{Index of wharf utilization (t/m)} = \frac{\text{Converted cargo volume (t)}}{\text{Converted mooring length (m)}}$$

66. According to experience, it is desirable that the index is less than 1,000 t/m. Although it can't reflect exactly the factor such as the kind of cargo, the method of cargo handling (ex. Container, Ro-Ro etc.), it seems to be a very effective way to capture the general view regarding wharf utilization of the port, considering that exclusive container handling system hasn't been introduced yet, and it is necessary to evaluate the bunkering oil movement from the point of view of both the import and the supply of it, which is, needless to say, also important for

the activities of the port of Balboa.

67. The process of the calculation and the result are shown in Table 2-2-3 and Figure 2-2-4. The major assumption employed in the calculation is as follows:

68. As cargo volume handled at the port, the cargo movement by wharf and by ship type prepared by APN is employed. These are all expressed in metric tons, which are used as it is under the assumption that they are nearly equal to that in freight ton. Regarding water supply, the water volume (gallons) supplied at each wharf is prepared by APN. The converting coefficient from gallon to freight ton is assumed as 0.003785 (freight ton(m³) / gallon).

69. Concerning bunkering oil, as well, the total volume movement (barrels) at the port reported to APN by A.P.S.A. is utilized. The volume of bunkering oil supplied to the ships is assigned to each wharf, Pier. 6, 7, 14, 15, 16 and 18, tentatively in proportion to that of water supply. The volume of bunkering oil imported by tanker at Pier. 6 and 7 is assigned in proportion to that of water supply at Pier. 6 and 7 in the same way. The converting coefficient from barrel to freight ton is assumed as 0.1589345 (freight ton(m³) / barrel).

70. The converting coefficient is 1.0 for the cargo handled by the ships of mixed cargo at the port (mainly general cargo imported), tuna ships and other ships; 0.5 for that of the Ro-Ro ships (mainly imported vehicle, which can be handled rapidly anywhere) and passenger ships as well; 1.0 for that of ships of container and refrigerator (not handled by exclusive equipment); 0.3 for that of the ships of bulk(solid: imported grain); and 0.1 petroleum, bulk(liquid), bunker and water (handled by exclusive equipment). The latter two coefficients are modified from average 0.5 to 0.3 or 0.1 respectively, with referring to the performance in neighboring countries (ex. 0.25 for the wharf of grain only with ship gear, 0.05 for the exclusive berth of large oil tanker, in Costa Rica).

71. The converted mooring length to that of the wharf of deep depth for each wharf remains the same since they all have berth depth of more than 7.5 meters.

72. According to Figure 2-2-4, the characteristics of each wharf are easily understood as aforementioned. Excluding bunker(both import and supply) and water, Pier 6, 14, 15 and 16 are used up to the level of 300 - 600 t /m, while Pier 7 and 18 are less than 100 t/m. When these are included, however, the levels of wharf utilization are increased impressively, especially at Pier 7 and 8, for which the import of bunker oil is exclusively assigned, and Pier 18 is found to be used

mainly for ship supply.

73. (APN should pay attention to the important activities of the port carefully, even if it isn't a direct port service of APN such as bunker and dry dock).

74. In this connection, APN calculates various indices related to the port operation efficiency by wharf in 1995 as shown in Table 2-2-4, the object of which is all the calling ships excluding the small ships of port service such as tugboats, barge and passenger ships through concession. In 1995, there was a total of 1,259 ship calls: 386 cargo ships, 501 ships for supply and 372 ships for other purposes.

75. Wharf Occupation is the ratio (%) of the total hours occupied by the ships to all the hours of the year for each berth. Pier No. 6, 7, 14, 15 and 16 have one berth respectively, while Pier No. 18 is assumed to have five berths (two on the north, one on the west and two on the south side). If several small ships moor a certain berth at the same time, this index can exceed the value of 1.0. Wharf occupancy is relatively high, around 70 % at each wharf. The rate goes up to 150% at Pier No.18, which is occupied by a number of small ships such as tuna boats at the same time.

76. Arrival Frequency is 3.44 (ship/ day) on the average, which means that Arrival Interval is the reciprocal number 0.29 (day/ ship). Waiting Time is 16.0 (hour/ ship), Service Time is 76.0 (hour/ ship), which decrease to around 60 (hour/ ship) excluding Pier No.18, and total Ship Stay is 92.0 (hour/ ship), that is 3.84 (day/ ship).

77. Waiting Time is calculated here, simply using both the arrival time to the anchorage area around the entrance of the Canal and the arrival time to the wharf without an exception. In this connection, it must be noted that the anchorage area and the waterway is common for both the ships calling at the port and the ships passing the Canal. According to PCC, however, they are administrated and operated independently and separately, and their orders to enter the waterway aren't affected by each other so much. Service Time is the total time of mooring. Anyway, an analysis that distinguishes cargo ships, ships for supply and others is desirable, based on the further data including the reason of unnecessary delay.

78. Other Indices are related to cargo ships. It is desirable to analyze them in the detail by ship type in the same way.

Table 2-2-3 Cargo Movement and Wharf Utilization by Wharf and Ship Type in 1995

Pier No.	Ship Type	Import		Export		Total		Mooring Length (m)	Level of Consolidation (ton/m)
		Total (ton)	Converted (ton)	Total (ton)	Converted (ton)	Total (ton)	Converted (ton)		
Total	Total	1,626,544	451,731	1,968,452	168,037	3,261,796	639,768	1,968	825
Total	Mixed	28,580	28,580	359	359	29,339	29,339	1,968	15
Total	RO-RO	19,509	9,865	4,441	721	21,050	10,525	1,968	5
Total	Bulk (Solid)	572,787	111,836	0	0	572,787	111,836	1,968	57
Total	Bulk (Liquid)	58,281	5,828	4,272	427	62,553	6,253	1,968	3
Total	Refrigerator	22	22	15	15	37	37	1,968	0
Total	Passenger	8	4	0	0	8	4	1,968	0
Total	Petroleum	1,850	185	0	0	1,850	185	1,968	0
Total	Container	158,376	158,376	55,761	55,761	214,337	214,337	1,968	139
Total	Tuna	61	61	498	438	475	475	1,968	0
Total	Others	12,085	12,085	30	30	12,065	12,065	1,968	6
Total	Bunker	1,244,123	124,413	1,758,421	119,842	2,447,559	244,255	1,968	124
Total	Water	0	0	104,745	10,473	104,745	10,473	1,968	5
6	Total	660,365	109,811	66,065	6,877	725,490	116,682	226	515
6	Mixed	0	0	0	0	0	0	226	0
6	RO-RO	6,555	3,278	168	84	6,723	3,362	226	15
6	Bulk (Solid)	156,745	45,724	0	0	156,745	46,724	226	207
6	Bulk (Liquid)	5,170	517	320	32	5,430	549	226	2
6	Refrigerator	0	0	0	0	0	0	226	0
6	Passenger	0	0	0	0	0	0	226	0
6	Petroleum	0	0	0	0	0	0	226	0
6	Container	0	0	0	0	0	0	226	0
6	Tuna	0	0	0	0	0	0	226	0
6	Others	11,116	11,116	0	0	11,116	11,115	226	43
6	Bunker	481,179	48,178	60,934	6,093	542,113	54,211	226	240
6	Water	0	0	5,873	527	5,873	527	226	2
7	Total	810,916	81,834	107,827	10,837	918,743	92,670	322	258
7	Mixed	286	286	0	0	286	285	322	1
7	RO-RO	0	0	0	0	0	0	322	0
7	Bulk (Solid)	2,302	681	0	0	2,302	681	322	2
7	Bulk (Liquid)	44,101	4,410	3,952	385	48,063	4,805	322	13
7	Refrigerator	22	22	15	15	37	37	322	0
7	Passenger	0	0	0	0	0	0	322	0
7	Petroleum	1,850	185	0	0	1,850	185	322	1
7	Container	0	0	0	0	0	0	322	0
7	Tuna	5	5	45	45	50	50	322	0
7	Others	0	0	0	0	0	0	322	0
7	Bunker	761,850	76,235	65,470	6,547	827,321	82,782	322	256
7	Water	0	0	8,344	824	8,344	824	322	3
14	Total	237,487	83,687	171,822	23,560	409,319	107,197	236	454
14	Mixed	1,301	1,301	0	0	1,301	1,301	236	6
14	RO-RO	2,873	1,137	643	325	2,822	1,461	236	6
14	Bulk (Solid)	210,925	63,278	0	0	210,925	63,278	236	293
14	Bulk (Liquid)	3,629	363	0	0	3,629	363	236	2
14	Refrigerator	0	0	0	0	0	0	236	0
14	Passenger	0	0	0	0	0	0	236	0
14	Petroleum	0	0	0	0	0	0	236	0
14	Container	17,359	17,359	6,733	6,733	24,092	24,092	236	102
14	Tuna	0	0	64	64	64	64	236	0
14	Others	0	0	0	0	0	0	236	0
14	Bunker	0	0	151,173	15,117	151,173	15,117	236	84
14	Water	0	0	13,213	1,321	13,213	1,321	236	6
15	Total	87,837	27,432	215,320	44,342	303,177	121,974	349	349
15	Mixed	2,579	2,579	345	345	2,925	2,925	349	8
15	RO-RO	9,424	4,712	519	260	9,643	4,972	349	14
15	Bulk (Solid)	3,815	1,145	0	0	3,815	1,145	349	3
15	Bulk (Liquid)	3,581	358	0	0	3,581	358	349	1
15	Refrigerator	0	0	0	0	0	0	349	0
15	Passenger	0	0	0	0	0	0	349	0
15	Petroleum	0	0	0	0	0	0	349	0
15	Container	68,652	68,652	24,581	24,981	93,633	53,633	349	258
15	Tuna	6	6	9	9	15	15	349	0
15	Others	0	0	0	0	0	0	349	0
15	Bunker	0	0	174,236	17,424	174,236	17,424	349	50
15	Water	0	0	13,229	1,323	13,229	1,323	349	4
16	Total	83,939	89,261	144,672	36,181	234,619	125,461	223	563
16	Mixed	16,017	16,017	0	0	16,017	16,017	223	72
16	RO-RO	1,867	679	165	53	1,452	731	223	3
16	Bulk (Solid)	0	0	0	0	0	0	223	0
16	Bulk (Liquid)	0	0	0	0	0	0	223	0
16	Refrigerator	0	0	0	0	0	0	223	0
16	Passenger	0	0	0	0	0	0	223	0
16	Petroleum	0	0	0	0	0	0	223	0
16	Container	72,565	72,565	24,047	24,047	96,612	56,612	223	433
16	Tuna	0	0	32	32	32	32	223	0
16	Others	0	0	0	0	0	0	223	0
16	Bunker	0	0	110,808	11,081	110,808	11,081	223	50
16	Water	0	0	9,685	928	9,685	928	223	4
18	Total	9,780	9,778	659,201	66,241	669,481	76,017	610	125
18	Mixed	8,797	8,797	13	13	8,810	8,810	610	14
18	RO-RO	0	0	0	0	0	0	610	0
18	Bulk (Solid)	0	0	0	0	0	0	610	0
18	Bulk (Liquid)	0	0	0	0	0	0	610	0
18	Refrigerator	0	0	0	0	0	0	610	0
18	Passenger	8	4	0	0	8	4	610	0
18	Petroleum	0	0	0	0	0	0	610	0
18	Container	0	0	0	0	0	0	610	0
18	Tuna	56	56	258	258	314	314	610	1
18	Others	519	519	30	30	549	549	610	2
18	Bunker	0	0	606,399	60,640	606,399	60,640	610	99
18	Water	0	0	53,001	5,300	53,001	5,300	610	9

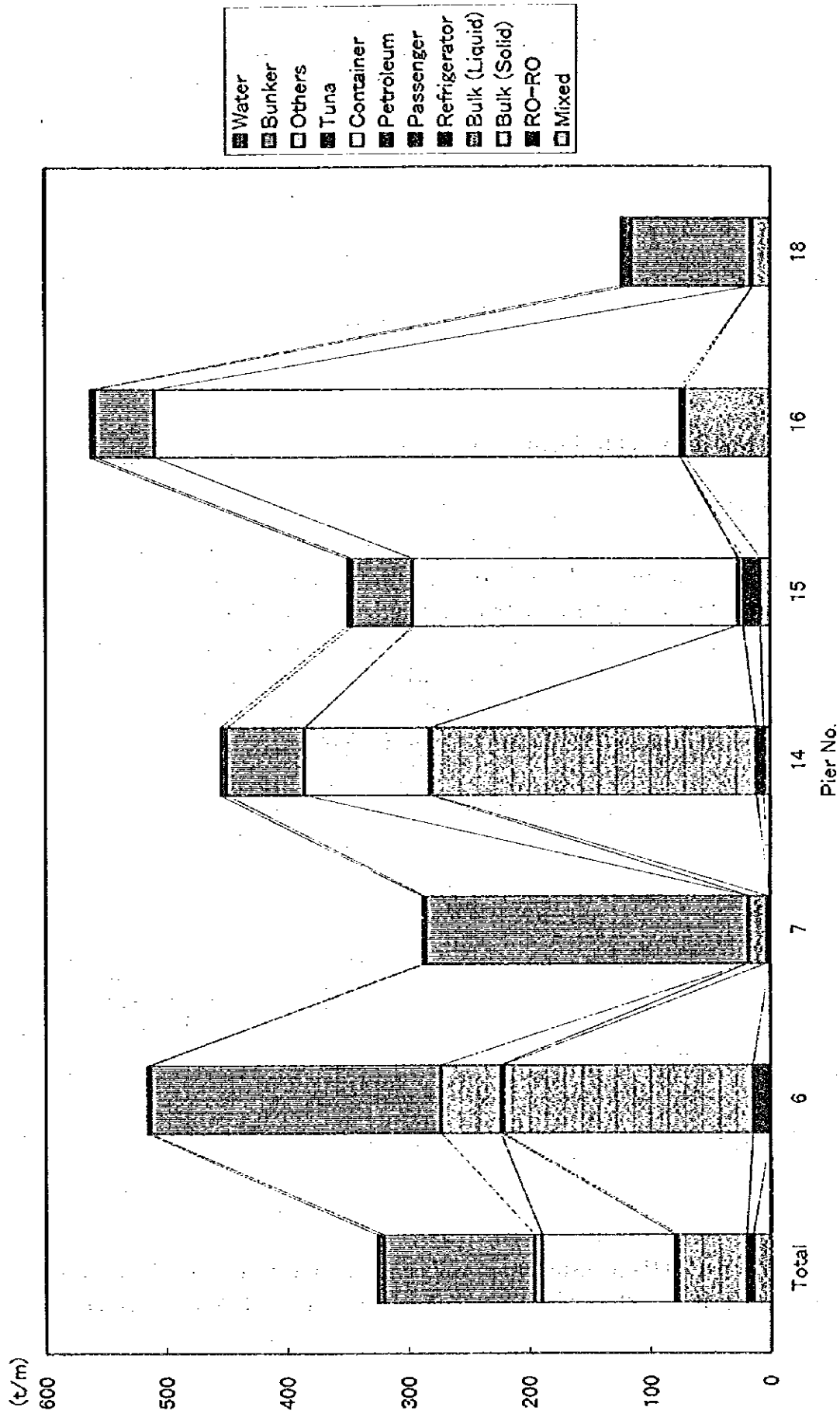


Figure 2-2-4 Wharf Utilization by Wharf and Ship Type in 1995

Table 2-2-4 Operation Index by Wharf in 1995

(Source: Autoridad Portuaria Nacional)

Operation Index	Pier No.						
	Total	6	7	14	15	16	18
Wharf Occupation (%)	110	69	86	85	100	106	144
Handled Cargo (m.t./ship)	1,857	4,936	1,318	4,378	1,009	1,042	414
Arrival Frequency (ship/day)	3.44	0.25	0.40	0.31	0.78	0.53	1.17
Waiting Time (hour/ship)	8.49	7.72	10.20	12.74	8.09	11.95	5.62
Service Time (hour/ship)	80.36	58.22	42.53	73.11	64.71	57.09	120.89
Performance Index (m.t./hour/ship)	0.12	1.78	1.01	1.12	0.34	0.38	0.20
Cargo Coefficient (m.t./G.T.)	0.13	0.31	0.24	0.27	0.05	0.08	0.06
Ship Stay (day/ship)	3.70	2.75	2.20	3.58	3.03	2.88	5.27

Source: APN

2.2.10 US Naval Base of Rodman

79. The US Naval Base of Rodman is located at the entrance of the Canal on the opposite bank of the current port of Balboa. This port has three(3) principal piers of up to 12 m in depth and other related facilities for fuel supply and operation, and the oil tank farm in Arraijan which is a few kilometers away from the port. The fuel is carried from and to the Naval Base of Rodman through 5 pipes of 10 to 20 inches of diameter, which are interconnected with 31 underground tanks with a capacity for a million barrels. General Characteristics of the port are put in order according to the piers in Table 2-2-5.

Table 2-2-5 General Characteristics of the Port of Rodman

(Source: Autoridad de la Region Interoceanica)

Pier	Dimensions (m)	Mooring Length by Side (m)	Maximum Ship Length by Side (m)	Maximum Depth by Each Side (m)	Use
No.1	257x15.2	214.6	213.4	12.2	Unload of Fuel
No.2	214.6x12.2	214.6	213.4	10.7	Unload of Fuel
No.3	214.6x12.2	214.6	213.4	8.5	Multiple Use
			167.7	8.5	for Emergency
Marina	31.1x11.0	30.0	30.0	7.0	Recreation
Mooring Platform 661	27.5x8.5	25.0	25.0	7.6	Mooring for Launch
Mooring Platform 95	24.4x5.5	20.0	20.0	7.6	Mooring for Launch
Total		718.8			

Source: ARI (Autoridad de la Region Interoceanica)

80. Major part of these installations will be reverted soon. These facilities will be released for private sectors with concession. Also refer to the following section.