

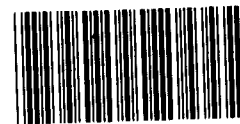
GAO

Briefing Report to the Chairman,
Subcommittee on Panama Canal and
Outer Continental Shelf, Committee on
Merchant Marine and Fisheries, House
of Representatives

September 1990

PANAMA CANAL COMMISSION

Revenue Forecasting and Marketing Efforts



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**National Security and
International Affairs Division**

B-240763

September 14, 1990

The Honorable Roy Dyson
Chairman, Subcommittee on Panama
Canal and Outer Continental Shelf
Committee on Merchant Marine and Fisheries
House of Representatives

Dear Mr. Chairman:

On March 15, 1990, you requested that we review the Panama Canal Commission's recently developed revenue forecasting methodology and the Commission's marketing efforts to promote the Canal. Also, at your request, we evaluated the Commission's procedures for collecting and maintaining data on Canal traffic to determine whether the amount of cargo originating from, or destined to, a specific port could be identified.

On June 28, 1990, we briefed your staff on the results of our review. This report summarizes and updates the information provided in that briefing.

Background

The Panama Canal Commission, established by the Panama Canal Act of 1979 (Public Law 96-70), is an agency of the executive branch of the United States government. The Commission manages, operates, and maintains the Canal on a self-financing basis and is expected to collect tolls and other revenues to cover all operating and maintenance costs, as well as obtain capital for plant replacement, expansion, and improvements. To comply with the Panama Canal Act's requirement to recover such costs, the Commission prepares forecasts of Canal traffic and toll revenue. Over the years, these forecasts have been prepared by Commission staff and, on occasion, by consulting firms under contract with the Commission.

The Commission's methodology for forecasting short-range revenue and cargo flows produced reasonably accurate figures during fiscal years 1980 through 1988. These figures fell within 5 percent of actual amounts. For each of those years, consistent with the Panama Canal Act, we reviewed and certified that the underlying assumptions used to

estimate cargo flows provided a reasonable basis for estimating revenues for the forthcoming fiscal year.¹

In 1988 the Commission contracted with Temple, Barker, & Sloane, Inc. (TBS) who, in association with Data Resources, Incorporated (DRI), was to develop an improved short- and long-range forecasting model. Inputs into the model are still being refined, and Commission officials stated that they are planning to consult with their contractors about other adjustments to the model.

Results in Brief

We believe that the methodology developed by TBS and DRI and now being used by the Commission to forecast revenues is sound and comprehensive. It provides sufficient flexibility for the Commission to adjust its revenue forecasting as conditions dictate. However, this model has been in use for less than 2 years, and only time will tell if it is a more accurate predictor of future revenue than the previous methodology, which proved quite accurate.

We found that the Commission's primary marketing emphasis is on keeping existing clients rather than on expanding its client base. Commission officials acknowledge that developing new business is extremely difficult because (1) other transportation modes are becoming increasingly competitive and (2) new trade routes that would be served by the Canal are only slowly developing.

The Commission does not maintain data on the specific ports of origin or destination of cargo passing through the Canal. Instead, information on where cargo comes from and goes to is maintained by the Commission on a more aggregated basis. For example, data would be available on areas served, such as the East Coast of the United States, the West Coast of South America, or Asia. Therefore, we were unable to identify the amount of cargo passing through the Canal destined for, or originating from, a specific port.

¹On December 22, 1987, the Congress amended the Panama Canal Act, changing the Panama Canal Commission Fund from an appropriated fund to a revolving fund. This amendment eliminated the requirement that we annually certify the Commission's estimated revenues.

Panama Canal Commission Revenue Forecasting Methodology

In 1988, the Commission contracted with TBS to develop a new long-range Canal forecast. As part of the forecast contract, TBS was also requested to develop an econometric forecasting model that could be used on the Commission's microcomputer system. This software modeling package was designed to provide Commission economists greater capability to revise forecasts and to test the impact of possible variations in certain key elements of Canal traffic. In April 1989, the first forecast using the new model produced cargo traffic and revenue estimates through fiscal year 2010. A second and, according to the Commission, more accurate forecast was produced in March 1990. The model ultimately contained two components—one to forecast cargo flows and another to forecast toll revenues.

To prepare commodity forecasts, TBS subcontracted with DRI, and together they adapted their jointly owned World Sea Trade Service to the trade routes and commodities serviced by the Canal. The Service is an econometric system of ocean trade forecasting and combines a historical trade database, commodity-specific forecasts, forecasts of international economic activity, and trade industry analyses to produce a commodity-specific trade forecast. The base forecast provided by the Service is updated every 3 months, and the data can be used to provide a Canal-specific forecast upon request by the Commission. This enables the Commission to monitor the amount of each commodity expected to go through the Canal during the forecast period and to revise the estimates quickly if there are indications that actual trade patterns are varying significantly from forecast targets.

The commodity forecast is reviewed by the Canal Commission; adjusted, if necessary, to account for recent Canal traffic data and developments affecting Canal trade; and then used as input into the revenue-forecasting model. A program then converts each commodity-specific forecast into the numbers, sizes, and types of ships expected to transit the Canal. Toll revenue is then calculated based on the projected Canal vessel traffic, with a goal of having the Canal meet all costs on a self-financing basis.

Our evaluation indicates that the forecasting methodology currently in use by the Canal Commission is sound and thorough. It overcame the Commission's problems with the previous methodology, allowing data to be manipulated quickly and easily, and thereby permitting the Commission to react to emerging economic conditions. Data are available by region, commodity, and trade route. The forecasting methodology (1) considers the market for and the shipping technology associated with

each commodity, (2) predicts changes in the level of economic activity and trade in the regions most used by the Canal, and (3) considers changes in the shipping industry, such as the use of larger vessels. The methodology is flexible enough to allow quick adjustments to forecasts for each commodity. If, over time, forecasts prove to be unreliable, the Commission can easily readjust.

Inputs used in the model are still being refined. The initial April 1989 forecast was optimistic and overstated projected Canal traffic. The second forecast, developed in March 1990, took into account lower cargo flow expectations. Estimates of future ship sizes were overstated and the anticipated number of transits were understated in the initial forecast and will also need refinement. These two factors balanced each other out and had no effect on revenue projections, but the Commission desires greater accuracy in these factors. Commission officials told us that they are planning to contract with TBS to address these and other issues.

Because the revenue-forecasting model currently used by the Commission is less than 2 years old, we do not know whether it will consistently produce more accurate forecasts than the prior methodology. Commission officials stated that the Commission's revenue-forecasting track record was very good and that improvements would be hard to attain. Nevertheless, our evaluation of the current forecasting methodology indicates that it is more comprehensive and flexible than the Commission's earlier model (see app. I and II for cargo flow and traffic and toll revenue forecasts).

Panama Canal Commission's Marketing Program

The Director of the Office of Executive Planning is the focal point within the Commission for market relations and trade development programs. A Marketing Policy Steering Committee composed of five senior level Commission executives makes policy for the overall marketing program, coordinates marketing plans and efforts, and ensures responsiveness to the needs of Canal customers.

In 1983, an Economic Research and Market Development Division was established in the Office of Executive Planning to strengthen ties with existing Canal customers, to explore and develop new market sources, and to help gain recognition for the Canal as an efficient and economically advantageous transportation alternative for world trade. The marketing section within the division is staffed by two marketing specialists, with one additional position currently vacant. However,

other Commission officials, including both the Director and Deputy Director of the Office of Executive Planning, also perform marketing functions during the normal course of their work.

The marketing group's primary mission is to maintain existing clients. Some examples of the Commission's past marketing activities include

- publishing articles concerning the Canal in trade journals, periodicals, and shipping industry magazines; sending current information about the Canal to maritime organizations; contacting port authorities and attending board meetings at key U.S. ports; and briefing visiting dignitaries and Canal customers,
- sending messages to Canal customers immediately following "Operation Just Cause"² to assure them that they would encounter no problems when transiting the Canal, and
- conducting face-to-face market surveys and maintaining communication with shippers and exporters in the Far East, Europe, Latin America, and the United States to tell Canal customers about the Canal's capabilities, toll rates, and costs and to discuss with users any problems they have encountered with Canal service.

The Commission's marketing plan for fiscal years 1989 through 1991 consists of the following four steps: (1) to enhance the database by greater use of automated resources for collecting and analyzing transit-related data, customer profiles, and other information; (2) to expand the lines of communication with customers through increased participation in conferences, symposiums, personal visits, and larger direct mailings; (3) to promote the Canal through trade journals and other periodicals as a preferred route for world shipping; and (4) to strengthen internal coordination efforts to promote the usefulness of the Canal.

Commission officials told us it is extremely difficult to attract new business to the Canal because of competition from other transportation sources, changes in world trade patterns, and slow development of new trade routes that could use the Canal. We were told by Commission sources that using differential toll rates for various commodities or types of shipping could possibly improve the Canal's competitive position in certain areas, but that the Commission is prohibited by law from having a multiple rate schedule.

²"Operation Just Cause" was the name of the American action in Panama on December 20, 1989.

Data on Vessels Transiting the Canal

The Commission's current procedures for collecting and maintaining data on Canal traffic do not readily identify the amount and type of cargo originating from or destined for a specific port. We found that the Commission maintains these types of data only on a country-to-country basis or, in the case of the United and Canada, by coastal region. We attempted to disaggregate these data to show the port of origin, the destination, and the cargo carried; however, we found that developing data beyond those maintained in the Commission's automated database could only be done by intensively reviewing individual ship documents for a given period.

The Commission collects 240 pieces of information on each of the estimated 1,100 ships that transit the Canal monthly. Some of this information is coded and entered into the Commission's Ship Data Bank system; however, specific ports of origin and destination are not entered. For example, a ship traveling from Baltimore to Tokyo would be recorded by its trade route—East Coast United States to Far East—rather than by specific ports. Furthermore, the system does not maintain information on commodities coming from or being delivered to specific ports.

Data on all vessels calling at any U.S. port may be purchased from the Port Import/Export Reporting Service (PIERS). PIERS' information identifies the vessel name, shipping line, date of arrival and departure, and port of origin. It also provides a description of the cargo. However, PIERS does not provide information on the ship's deployment route. For example, PIERS would show that a vessel had traveled from Tokyo to Baltimore but would not indicate whether the ship had transited the Panama Canal or had arrived by another route.

Scope and Methodology

We interviewed and obtained records from Commission officials in the offices of Executive Planning, Finance, and Marine Bureau in Balboa, Republic of Panama, to obtain information on revenue forecasts, marketing efforts, and data availability for the amount and type of cargo transiting the Canal originating from or destined for specific ports. We did not verify Commission-provided data.

We reviewed the economic forecasts prepared by Temple, Barker, & Sloane, Inc., as well as those prepared by the Panama Canal Commission. Our review included assessments of the underlying assumptions of the model and the reasonableness of the data and analytical techniques used in developing the forecasts. We also interviewed a vice president of

PIERS in New York to obtain information on the data available through its reporting service.

We performed our review from May through August 1990 in accordance with generally accepted government auditing standards.

We discussed the contents of this report with the Acting Director of Executive Planning, the Acting Administrator, and the Deputy Administrator of the Panama Canal Commission. Their comments have been incorporated where appropriate. However, as agreed with your office, we did not obtain written agency comments on this report.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to the Administrator, Panama Canal Commission. We will also make copies available to others upon request.

GAO staff members who made major contributions to this report are listed in appendix III. A list of related GAO reports is provided on the last page of this report. If you or your staff have any questions concerning this report, please contact me on (202) 275-5790.

Sincerely yours,



Harold J. Johnson
Director, Foreign Economic
Assistance Issues

Contents

Letter	1
Appendix I Panama Canal Commission Cargo Forecasts by Commodity Group	10
Appendix II Panama Canal Traffic and Toll Revenue Forecasts	11
Appendix III Major Contributors to This Report	12
Related GAO Products	16

Abbreviations

GAO	General Accounting Office
DRI	Data Resources, Incorporated
PIERS	Port Import/Export Reporting Service
TBS	Temple, Barker, & Sloane, Inc.

Panama Canal Commission Cargo Forecasts by Commodity Group

Long tons in thousands

Commodity group	Fiscal year							
	1989 (actual)	1990	1991	1992	1995	2000	2005	2010
Automobiles	1,990	1,718	1,629	1,638	1,670	1,773	1,946	2,021
Alumina/bauxite	2,385	3,077	3,329	3,508	4,367	4,537	5,351	6,048
Bananas	1,375	1,641	1,854	2,057	2,442	2,823	3,081	3,363
Chemicals	5,508	4,537	4,709	4,963	5,396	6,647	7,574	8,643
Coal & coke	8,934	8,757	8,329	8,001	7,272	7,445	7,528	7,687
Fertilizers	5,601	4,890	5,099	5,176	5,871	6,598	7,175	7,862
Food & agric.	3,041	3,135	3,187	3,250	3,524	3,764	3,953	4,157
Grains, other	13,647	17,378	18,287	18,968	20,376	23,651	25,958	28,523
Iron & steel	7,850	7,632	7,534	7,656	7,891	9,070	9,957	10,973
Lumber products	6,361	6,375	6,811	7,194	7,973	8,356	9,535	10,294
Metals, other	1,658	1,786	1,800	1,813	1,832	1,859	1,897	1,938
Minerals, misc.	4,389	6,084	6,044	6,027	6,043	6,191	6,384	6,670
Ores, other	4,448	5,147	5,194	5,220	5,367	5,466	5,638	5,836
Paper	1,419	1,407	1,460	1,541	1,767	2,283	2,661	3,111
Petroleum, chem.	2,117	1,493	1,468	1,472	1,487	1,396	1,353	1,325
Petroleum, coke	3,184	3,375	3,455	3,528	3,847	4,176	4,407	4,653
Petroleum, crude	7,873	7,517	7,982	7,978	7,910	7,430	7,249	7,137
Petroleum, prod.	7,003	7,491	7,238	7,169	7,277	7,556	7,702	7,856
Petroleum, resid.	4,174	5,003	5,072	5,234	5,633	6,011	6,390	6,795
Phosphates	8,603	8,514	8,358	8,347	8,452	9,997	11,176	12,518
Pulpwood	3,084	3,154	3,213	3,300	3,482	4,213	4,772	5,464
Refrigerated cargo, other	3,377	3,648	3,929	4,196	4,757	5,416	5,878	6,388
Scrap metal	2,019	1,517	1,579	1,628	1,527	1,622	1,689	1,760
Soybeans	5,243	6,021	5,999	6,187	6,787	7,889	9,137	10,603
Sugar	3,364	2,785	2,640	2,533	2,371	2,504	2,674	2,901
Wheat	11,027	6,295	6,439	6,602	6,908	7,842	8,487	9,191
All other	2,049	1,830	1,895	1,958	2,239	2,565	2,817	3,097
Containerized	19,913	19,901	20,422	21,021	22,052	24,035	25,460	27,553
Total	151,636	152,108	154,955	158,165	166,520	183,615	197,829	214,367

Source: Data provided by the Panama Canal Commission.

Panama Canal Traffic and Toll Revenue Forecasts

Fiscal year	Oceangoing transits		Toll revenue (Dollars in millions)	Net tonnage (Tons in millions) ^a	Small vessel transits
	Total	Daily average			
1989 (actual)	12,075	33.1	\$329.8	187.0	1,314
1990	11,950	32.7	357.0	184.8	1,300
1991	12,050	33.0	364.0	188.4	1,300
1992	12,150	33.2	374.0	193.6	1,300
1995	12,295	33.7	394.0	203.9	1,300
2000	12,665	34.7	436.5	225.9	1,300
2005	13,140	36.0	472.5	244.6	1,300
2010	13,560	37.2	510.0	264.0	1,300

^aNet tonnage is calculated by converting cargo tons by commodity into Panama Canal net tons based on a conversion matrix by vessel type and selected trade route. The resulting Panama Canal net tonnage for each commodity varies depending on the type of vessel carrying the commodity and on load factors. For example, the Panama Canal net ton/cargo ton ratio for automobile shipments is higher than other commodities because of the configuration of the ships used to transport automobiles.

Source: Data provided by the Panama Canal Commission.

Major Contributors to This Report

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Related GAO Products

Certification of Panama Canal Commission Estimated Revenues for Fiscal Year 1980 (ID-80-8, Oct. 26, 1979).

Certification of Panama Canal Commission Estimated Revenues for Fiscal Year 1981 (ID-80-19, Mar. 6, 1980).

Certification of Panama Canal Commission Estimated Revenues for Fiscal Year 1982 (ID-81-34, Feb. 24, 1981).

Certification of Panama Canal Commission Estimated Revenues for Fiscal Year 1983 (ID-82-26, Mar. 19, 1982).

Certification of Panama Canal Commission Estimated Revenues for Fiscal Year 1984 (GAO/ID-83-29, Mar. 21, 1983).

Certification of Panama Canal Commission Estimated Revenues for Fiscal Year 1985 (GAO/NSIAD-84-95, June 19, 1984).

Certification of Panama Canal Commission Estimated Revenues for Fiscal Year 1986 (GAO/AFMD-85-42, Feb. 25, 1985).

Certification of Panama Canal Commission Estimated Revenues for Fiscal Year 1987 (GAO/AFMD-86-35, Apr. 15, 1986).

Revenue Estimate: Panama Canal Commission Estimated Revenue for Fiscal Year 1988 (GAO/AFMD-87-25, May 1, 1987).

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