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The Jamaica Railway — A Preliminary Survey

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Abstract

This paper provides a survey of the experience of the Jamaica Railway Corporation, the last common carrier railway in the British Caribbean. One of the oldest railways in the Western Hemisphere, the portion between Kingston and Spanish Town has provided freight and passenger service for 145 years. The system was built piece-meal, the main lines not completed until the late 1890s. The railroad has undergone a major transition over the last fifty years. Originally it was primarily a carrier of passengers, bananas for export, sugar cane and sugar, plus inbound general merchandise. The development of road transport caused a sharp drop in the banana and merchandise traffic, which was replaced by bauxite and alumina for ALCAN and ALCOA, as the bauxite industry developed in the 1950s. As of 1985 the bauxite traffic remains the dominant source of revenue, despite decline in bauxite production. The passenger traffic, while below the peak years, has held up remarkably well; the traffic fluctuates primarily with the amount of service the railroad has equipment to provide.

The railroad has consistently operated at a deficit. But it makes substantial contribution to the bauxite industry, and its passenger service is much cheaper and satisfactory than the mini-bus type otherwise available. Externalities in terms of road congestion and costs of road improvement and encouragement to economic development warrant continuation of and improvement to the railway.

THE JAMAICA RAILWAY--A PRELIMINARY SURVEY*

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The Jamaica Railway is the last common carrier railway in the British Commonwealth Caribbean, and provides an excellent example of a railway in a developing country that has undergone drastic transformation in its freight traffic over three decades.

Development[1]

The railway was initially a product of several forces, the most important being the belief of local persons in the 1840s that a railway from Kingston would greatly facilitate the flow of produce into the city and of manure to the farm areas, thus increasing agricultural production. It was also believed that the railroad would lead to the building of sugar factories in the interior. Ironically, as history repeats itself, in the 1840s the Governor favored the project because of the traffic congestion on the road between Kingston and Spanish Town. Specifically the Smith Brothers, one a local planter, the other a Manchester, England, merchant with land in Jamaica, were the principal promoters. The firm was incorporated in 1843, capital raised in England, construction began in 1844, and the line completed to Spanish Town, 14 miles, in 1845, not much over a decade after the first commercial railroad was built in Great Britain, and only a decade after the slaves were freed in the British West Indies. But the decline in sugar fortunes in the late 'forties made expansion of the line impossible, and for over 20 years, all this time under Smith management, the line remained little

*The author is greatly indebted to Mrs. Betty Ann Jones-Kerr of Peat Marwick and Mitchell, Kingston, and to Mr. Eric Shirley and Mr. Raymond Girard, former General Managers of the Jamaica Railway Corporation, for their assistance.

1. This section is based on material in The Railway in Jamaica, A Short History, 1845-1970, Kingston: 1970.

more than a passenger carrier between the island's two major cities. In 1869 the line was extended to Old Harbour, an additional 12 miles, but the financial position of the company deteriorated, and finally in 1879 the government purchased the railroad.

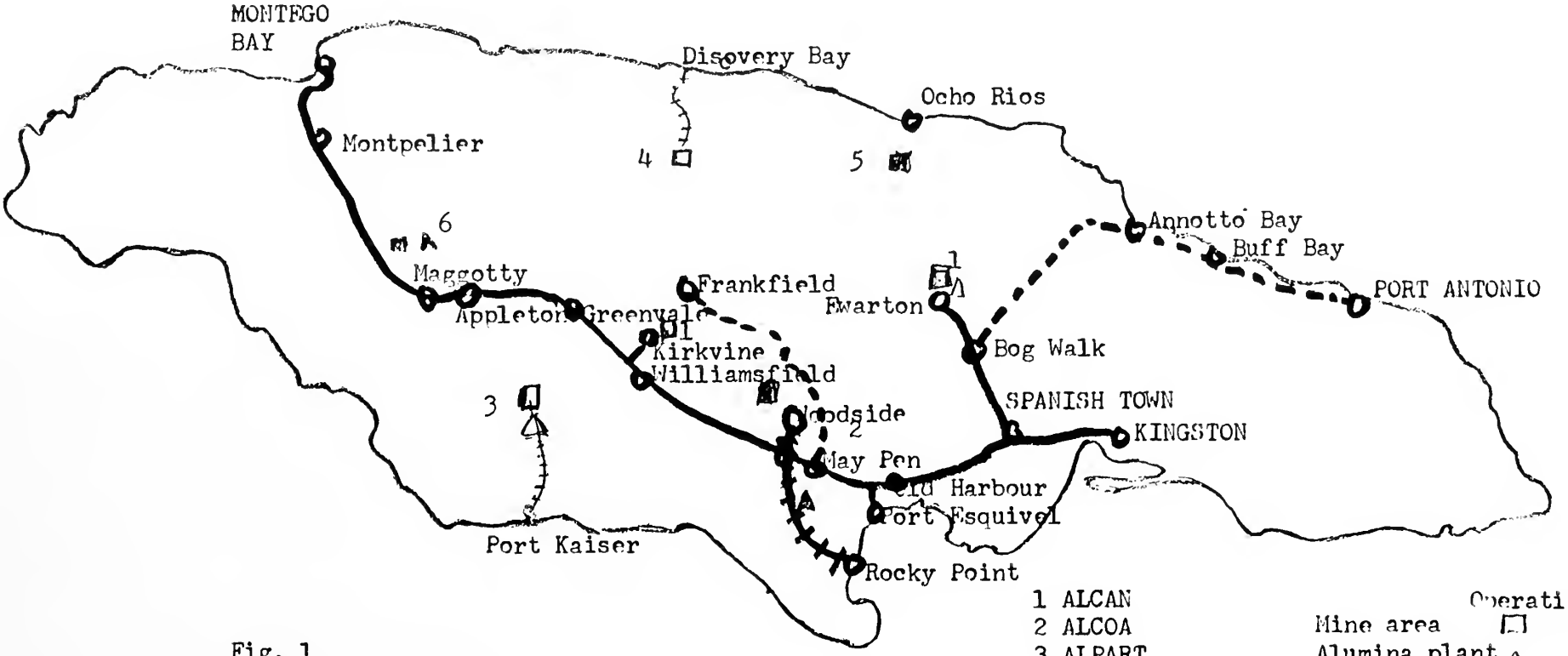
Under government ownership and financial aid, the lines were extended to Porus and to Ewarton in the 1880s, primarily because of the growing banana and citrus production, to bring mileage to 64 by 1889. The government ultimately, however, decided to dispose of the company to an American syndicate, the West India Improvement Company, in the hope of seeing the lines extended by private capital, given the financial difficulties of the government.

With the railroad in private hands and with access to foreign capital, the system was rapidly extended. The 66 mile extension from Porus to Montego Bay was opened in 1894, and the 64 mile line from Bog Walk, on the Ewarton line, to Port Antonio in 1896. But traffic grew much less than the promoters anticipated; the company defaulted on its bonds in 1898, and in 1900, once more the railroad was back in government hands. From 1900 to 1959 the railroad was operated as a government department. The early years were plagued by a devastating hurricane, and then by the great earthquake of 1907. Increased banana production led to building of lines from May Pen to Frankfield in 1925. During World War II, a line was built to the U.S. military base at Fort Simonds. The rail lines are shown on Fig. 1.

Road Competition and Bauxite

The railroad was operating its maximum mileage in the nineteen thirties and early forties; the main line Kingston to Montego Bay, the newly completed branch to Frankfield, and the long line from Spanish Town to Port Antonio, with the branch from Bog Walk to Ewarton. Outbound bananas, primarily to Port Antonio, sugar and citrus were key elements in the traffic; imports and domestic products from the Kingston area moved inbound. The passenger traffic was substantial.

Fig, I



1 ALCAN
2 ALCOA
3 ALPART
4 Kaiser
5 Reynolds
6 Revere

Operating Close
Mine area □ ■
Alumina plant △ ▲

Fig, 1
Railways of Jamaica

Jamaica Railway Corp,, operating ——
not operating - - -
Bauxite company private lines ++++++
ALCOA line operated by Jamaica Ry, ++++

As of the late twenties, bananas were the major revenue source, yielding over 80 percent of freight revenues. While road competition began in the 1920s, it was not serious in the prewar and war years, and the fruit, sugar cane, and sugar traffic remained important up into the fifties, as shown by Table 1. Banana traffic was seriously reduced for a time by decline in production, but this later recovered.

Table 1
Freight Traffic by Type, 1958-1960, Jamaica Railway
000 tons

	1956	1958	1960
Bananas	68	83	92
Sugar Cane	152	130	94
Citrus	17	6	3
Sugar	56	12	13
General Merchandise	246	291	64
Alumina and Bauxite	199	381	636
Processing Materials	ns	ns	347
Livestock, Head	6600	4600	3186
Vehicles, number	na	1700	1483

ns: not shown separately.
Source: U.K. Colonial Office, Annual Report on Jamaica, respective years.

As shown in Table 2, however, by 1970 the banana traffic had disappeared, as had a substantial portion of the commercial freight traffic. Even before the decline in the traditional traffic, the road had experienced substantial losses, as shown in Table 6. Had it not been for the development of the bauxite traffic, the railway might well have gone the route of the railway in Barbados (abandoned in 1937) and those in other commonwealth Caribbean islands. The first warning came in 1948, when the Ewarton line was cut back to Linstead for lack of traffic (only to be rebuilt in 1957 for the bauxite industry).

The railroad was essentially saved by the development of the bauxite industry. Bauxite deposits had been known to exist in Jamaica in the latter part of the last century, but development came only after 1952.[2] Reynolds began to mine in the Ocho Rios area in 1952, but without access to the railway; bauxite exported from Ocho Rios was brought to the docks by a conveyor belt. In the same year, Alumina Jamaica Ltd., a portion of ALCAN, began to produce bauxite and convert it to alumina at Kirkvine, and a short branch of the railway was built from Williamsfield to Kirkvine, and from Bodles Jct. to Port Esquivel, on the south coast, for this traffic. Then in 1957, ALCAN build a second plant at Ewarton; the railway relaid the track from Linstead to Ewarton, and bauxite and alumina began to move on the Ewarton line to Port Esquivel. Then in 1961, ALCOA developed mines at Woodside in the Breadnut valley in Clarendon, and built a railway from Woodside to Rocky Point, crossing the Jamaica Railway main line at Jacob's Hut. Jamaica Railway operates the line for ALCOA. In 1968 Revere built an alumina plant near Maggoty in St. Elizabeth, and used the rail line to and from the port at Rocky Point, shipments commencing in 1971. Revere closed operations in October 1975. Jamaica Railway is not involved in the Kaiser or Alpart operations; Kaiser built and operates its own railway from the mines in Water Valley to Port Rhoades on Discovery Bay, west of Ocho Rios. Alpart (Alumina Partners, jointly owned by Kaiser and Reynolds) mines and produces alumina at Alpart and ships over its own railrad to Port Kaiser on the South Coast.

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2. The bauxite industry is described in the article by Richard A. Thomas, "Jamaica: Government Partnerships and Recent Declines Shape Industry's Profile," Engineering and Mining Journal, November 1979, pp. 98-101.

Creation of the Jamaica Railway Corporation

In 1960, following a policy common in other parts of the world, the Jamaica Railway Corporation Act was enacted, forming the Jamaica Railway Corporation, to take over the railway. The Act read, in part:

> (a) to manage and operate in accordance with this Law the Railway hereby transferred to the Corporation and any expansion or extension there of and any New Railway and to provide all reasonable facilities for carriage by the Corporation of passengers and goods.
>
> Provided that the Corporation shall not be under an obligation to continue or introduce any particular service or facility which is uneconomic, or which appears to the Corporation unlikely to provide within a reasonable time adequate revenue to meet the cost to the Corporation .....

Thus the organization was changed from a government department to a separate semi-autonomous but government-owned statutory corporation, with a distinct corporate structure; a government appointed chairman, a Board of Directors; and typical railway management structure. The railway has substantial financial and operational autonomy. This period also saw completion of dieselization, which began in the late 1940s.

The fortunes of the railway since 1959 have fluctuated with the output of bauxite and alumina, and the adequacy of equipment to meet traffic potential. Freight traffic other than that of the bauxite industry continued to decline; comparison of the revenues from the various types of traffic for the 1968-70 period with those of the 1981-83 period, shown in Table 2, provide clear illustration.

Table 2
Sources of Revenues, Jamaica Railway, 1968-70; 1981-83. Jamaica $s

	1968	1969	1970	1981	1982	1983
Alumina and Bauxite*	1,388,200	1,583,607	1,778,613	12,100,000	10,270,000	12,440,000
Bananas	10,750	6,533	377			
Commercial freight	132,148	134,809	139,413	210,000	200,000	230,000
Mail	6,800	6,864	7,184			
Passengers	499,042	563,808	561,698	1,680,000	1,740,000	1,280,000
Total	2,120,004	2,395,692	2,575,209	13,990,000	12,210,000	13,950,000

Source: Jamaica Statistical Yearbook, 1971, 1982: Jamaica Railway Corporation,

Percentage Distribution of Revenue, Major Sources,
Jamaica Railway, 1968-70, 1981-83

Alumina and Bauxite*	65.5	66.1	69.1	86.5	84.1	89.1
Bananas	.5	.3	neg			
Commercial freight	6.2	5.6	5.4	1.5	1.6	1.7
Mail	.3	.3	.3			
Passengers	23.5	23.5	21.8	12.0	14.3	9.2
Miscellaneous	4.0	4.2	3.4	0	0	0
Total	100	100	100	100	100	100

*including inbound traffic for the industry.

Thus nearly 90 percent of the revenue comes from the bauxite and alumina industr traffic; commercial freight is a very minor element, and the percentage of passenger revenue fell roughly in half between the two periods. The banana traffic was ending in the late sixties, before the sharp decline in commercial freight traffic occurred in the decade of the seventies.

A Closer Look at the Passenger Traffic

Table 3 provides information on passenger traffic and passenger revenue since 1950. Passenger miles are available for only a few years.

Table 3
Passengers Traffic, Jamaica Railway, 1938; 1950-1984

Year	Passengers Carried millions	Passenger Miles millions	Passenger revenue thousands
1938			J$s 25
1950			65
1951			77
1952			110
1953			124
1954	1053		126
1955	1026		139
1956	1088		142
1957	1106		145
1958	1254		149
1959	1084		131
1960	1045		133
1961	816		135
1962	801		129
1963	974		169
1964	1038		204
1965	1156		214
1966	1231	35,705	228; J$s 456
1967	1050	30,436	478
1968	1087	31,510	499
1969	1252	36,300	564
1970	1146	44,724	562
1971	1012	39,474	509
1972	1067	41,606	527
1973	1018	39,506	491
1974	1081	42,167	627
1975	1188	86,400	932
1976	1174	101,200	867
1977	2016		1285
1978	2690		2221
1979	na		na
1980	na		na
1981	990		1680
1982	700		1740
1983	573		1280
1984	932		na

Sources: U.K. Colonial Office , Annual Report on Jamaica, various years; Jamaica Statistical Yearbook, various; Planning Institute of Jamaica, Economic and Social Survey, Jamaica, 1983; Jamaica Railway, Newsletter, December 1984.

The total volume of passenger traffic has remained remarkably stable over much of the period, close to 1 million in the entire period 1954-1976, and rose sharply in the mid seventies with greatly improved and additional service. Then it fell in the early eighties as the shortage of diesels made it necessary to cut service back sharply, and the line to Port Antonio was discontinued. Traffic rose again in 1984 close to the million mark as service was increased again despite elimination of service from Bog Walk to Buff Bay. The railroad has used diesel rail cars in several periods, first in the late forties to replace 45 year old passenger cars. Then in 1962, the railway purchased 20 Metro Cammell rail cars, equipped with six cylinder Rolls Royce engines. But the equipment did not stand up well under the steep grades and sharp curves of the lines, and the cooling systems were inadequate. Thus the wear and tear on the engines and undercarriages was excessive, and parts proved difficult to obtain. Thus failures became common, and ultimately the engines were removed and the cars used as passenger coaches. The quality of the equipment was simply not adequate for the conditions.

As of 1985, two trains are operated each way daily on the main line Kingston-Montego Bay. Two trains are operated each way on the Ewarton line, and one additional train from Porus and May Pen on the main line to Kingston. The latter are essentially commuter trains. As one illustration of traffic potential, since passenger service was restored on the Ewarton line, it has been carrying about 1500 passengers a day, including school children. In the fall of 1983 service was discontinued from Bog Walk to Buff Bay.

Fares for many years were 3 J¢ per mile (second class), a very low figure. Increases require cabinet approval, which has often been slow in forthcoming, because of the importance to the users of low fares. The basic

second class fare is (mid 1985) J¢ 10.6 (about two U.S. cents). The first class fare is double the second class fare. These fares are typically much lower than mini-bus fares; for example, in mid 1984, the rail second class fare from Kingston to Montego Bay was $9 ($12.50 as of mid 1985), compared to a mini-bus fare of $17.[4]

Views differ on the profitability of the passenger service. The only clearly profitable passenger service consists of two special elements:

1. The well-advertised "Governor's Coach" service, between Montego Bay and Appleton station, the trains operated by the railway but the tours managed by Jamaica Tours Ltd., a public corporation.

2. Special trains, typically operated on weekends and holidays, for benevolent societies, social clubs, trade unions, etc.

Passenger cars are relatively modern, most acquired in the last decade.

The railway plans to improve and increase passenger service over the next several years, and believes that the volume can be restored to the 1978 level, which was twice that of the long period volume.

There has been substantial complaint about the decline in service and closure of the service to Buff Bay; a feature article in the Daily Gleaner, July 1, 1984, was devoted to this question. Many letters have been written to the editor, and to the railway and the Ministry, complaining about the inadequacy and cost of the road transport, particularly in the area served by the line to Port Antonio.

The Volume of Freight Traffic

It is not possible to provide a consistent picture of the freight traffic statistics over the 30 year period 1950-1984, because the base of the series in available form changes. However, some trends and comparisons can be noted, as shown in Table 4. The trend in tons carried was upward, with minor deviations from the trend, from 1950 to 1966, and the series for ton miles

4. Kingston Daily Gleaner, July 1, 1984.

continued the same trend up to 1974, the all time high in total ton miles. This constituted about 60,000 net ton miles per mile of line, taking the system as a whole. For the lines on which most of the traffic moved, the figure was about 155,000 ton miles per mile of line. On the basis of standards of other countries, this is great enough to allow many of the economies of scale. The 60,000 figure is relatively low, and thus suggests higher cost per ton mile--but is substantially more than many light traffic lines in the United States and Canada, and is not necessarily uneconomically low.

From 1979 on, the total traffic has run somewhat lower as bauxite production fell, except for a good year in 1977, and has become somewhat irregular. The 1983 figure, in tons, however,is about 25% greater than the 1965 figure. In general, therefore, the trends in total traffic are dominated almost entirely by trends in the bauxite industry, which has not been in good financial shape in the last decade. At times, strikes and accidents reduced the production below expected levels. The 1984 predictions of ALCOA and ALCAN were for increased production over the next five years. ALCOA, however, closed its Clarendon works on February 20, 1985. In April, plans to reopen were announced, ALCOA operating the plant, the government taking over the marketing. ALCOA owns a 94-percent interest, the government, 6 percent.

In addition to the outbound traffic in bauxite and alumina, the railway carries substantial inbound traffic for the bauxite industry, primarily oil, caustic soda, and lime.

Other Potential Freight Traffic

The extreme reliance of the railroad upon the bauxite industry places it in a vulnerable position if production falls significantly. Accordingly the railroad has been seeking to rebuild the general freight traffic that it had lost over the years. There are several possibilities, in general involving bulk commodities:[5]

5. Based on information supplied by the railway.

Table 4. Freight Traffic, Jamaica Railway, 1950-1984

Year	Ton miles	Tons 000s	Freight Revenue 000s
1950		347	£s
1951		352	
1952		383	
1953		537	
1954		570	401
1955		624	417
1956		733	518
1957		764	484
1958		1078	620
1959		900	539
1960		1009	585
1961		1263	686
1962		1200	667
1963		1345	703
1964		1930	762
1965		2172	818
1966	62,718	2275	823
1967	68,129		J$ 1531
1968	71,652		1725
1969	80,889		1918
1970	77,527		
1971	83,629		
1972	113,227		
1973	95,135		
1974	123,158		
1975	99,166		
1976	97,231		
1977	114,035		
1978	76,322		
1979			
1980	na		
1981	na		
1982	na		
1983		2864	11,830

Source: U.K. Colonial Office, Annual Report on Jamaica, 1947-1961; Jamaica Statistical Yearbook, various years; Jamaica Railway Corporation.

Sugar cane. With the closing of the sugar mill at Grey's Inn, near Annoto Bay, there is potential for hauling substantial volumes of sugar cane from Grey's Inn to the factory at Bernard Lodge, 2 miles southeast of Spanish Town station, and from Innswood to Bernard Lodge. This in total could constitute 320,000 tons a year.

Cement. The road has sought, so far without success, to obtain the contract to move cement from Kingston to Montego Bay, a potential revenue of J$1.8 million per year.

Bottled Drinks, from Kingston to Montego Bay and other depot points. Use of containers has been considered.

Coal. The alumina plants have been considering replacing oil by coal for processing; this would result in a net increase in the total volume of traffic.

Containers. There is considerable potential for moving containers from Kingston to Montego Bay and other points on the main line. The railroad is willing to quote lower rates than the present road rates. But it cannot handle containers without new equipment for container handling.

There are other possibilities as well, including lumber from Portland to Spanish Town, if the Port Antonio line were rebuilt, and milk products from Bog Walk to Montpelier, near Montego Bay (traffic the railroad retained until 1981 when inadequate service caused the shipper to shift to road transport). Movement of aggregate and sand to Montego Bay is another possibility.

It is difficult to assess the likelihood of gaining this type of traffic. Despite the usual road transport advantages on short hauls, the special circumstances in Jamaica render use of rail a possibility. The high cost of petroleum products, the importance of conserving foreign exchange, the very congested condition of many roads, suggest the potential advantages of the

railway in handling bulk traffic. But such traffic can be obtained and retaine only with high quality service, which the railroad is now seeking to provide.

The only planned extension of track consists of lines to reach dock areas in Kingston and Montego Bay to facilitate handling of general freight traffic. Financing is not yet available for these.

The Railroad as of Early 1985

As of early 1985, the railroad operates two lines and a short branch of its own:

Kingston-Montego Bay, 113 miles

Spanish Town-Ewarton, 15 miles

Port Esquivel branch, 3 miles

In addition, it operates the 20 mile line owned by ALCOA. Classified in a different way, the road is operating two relatively distinct parts:

The Bauxite Triangle, Williamsfield, on the main line, to Port Esquivel, and Ewarton to Port Esquivel via Spanish Town. This is the heavy density portion of the system, which generates most of the freight revenue. In addition the triangle includes the line owned by ALCOA in Clarendon from the mi Breadnut Valley to the alumina plant in Hulse Hall and the shipping point at Rocky Point.

The remainder of the main line, Kingston to Spanish Town and Williamsfield to Montego Bay, operated for passenger and general freight service.

The line from Bog Walk to Buff Bay, 43 miles, is intact but not operated, and the portion from Buff Bay to Port Antonio, 15 miles, has been out of servic for five years because of a two mile washout from the 1980 hurricane. The 23 mile line from May Pen to Frankfield was abandoned in 1975. Most of the track is in place, but the ties and ballast have disintegrated.

The line is standard guage. The maximum grade is 3.3%, Porus to Williamsf The maximum elevation is reached at Greenvale on the main line, 1705 feet.

There are 90 miles of level line and 112 on grade (for the whole system, including the Port Antonio line) and very substantial curvature. There are 232 bridges and the phenominal number of 41 tunnels; 13 on the main line, 28 on the Port Antonio line.

Equipment. As of 1985, the line has 16 MLW diesels, not all in service because of parts shortages, and 6 Alsthom-Atlantique French built engines, delivered in 1984, with an additional six on order. Dieselization began in 1946, but lack of funds and greater traffic required partial use of steam locomotives well into the 1970s. The original diesels were 750 hp. English Electrics. With the delivery of the last six French locomotives, the road will have 28, with 20 available at all times for operations.

The company has a limited number of freight cars, since the cars for the bauxite and alumina service are provided by the shippers (covered hoppers for alumina, open hoppers for bauxite). The line has (1984) 30 usable box cars, with 65 that could be made serviceable if necessary, 8 tanker wagons for oil, and 6 flat cars. Attempts have been made in recent years to upgrade maintenance of equipment.

Track. The track design has recently been reviewed with the assistance of consultants from France. The rail is primarily 80 pound; this weight will be retained, though some heavier rail may be used in the future. The track will tolerate weights of 17 tons per axle. The first several miles out of Kingston to Gregory Park (which does not have heavy freight traffic) will use welded rail on wooden sleepers. From Gregory Park to Porus on the main line and to Ewarton, continuous welded rail with concrete sleepers will be used, and wood sleepers from Porus to Williamsfield. The portion from Williamsfield to Montego Bay will be improved, particularly adzing tie replacement, and reestablishment of cant on the rails. The line has the

necessary equipment for this work. Rail removed from the bauxite lines will be used on this portion. Much of the reballasting and tie renewal has been done on the bauxite lines.

Employees. Data on the number of employees are not complete for the three decades, but those for available years give a good indication of trends, shown in Table 5.

Table 5

Number of Employees, Jamaica Railways, Selected Years

Year	Number of Employees	Year	Number of Employees
1966	1505	1973	1448
1967	1500	1974	1450
1968	1489	1975	1420
1969	1454	1976	1242
1970	1476	1977	1369
1971	1500	1978	1277
1972	1504	--	
		1984	1100

Source: Jamaica Statistical Yearbook, various years; Jamaica Railway Corporation

The number stayed between 1400 and 1500 for a long period of time, and then declined with the elimination of service to Frankfield, Port Antonio, and Bog Walk--Buff Bay. The number of employees relative to traffic is high compared to railroads of comparable size in the United States, but it is not necessarily uneconomic, given wage levels, and is desirable from the standpoint of the unemployment problem in Jamaica.

Rates. The rates for ALCOA and ALCAN traffic, which are negotiated, are considered satisfactory by the railway. The general freight rates have been retained at low levels. Some idea of the railway's views about potential rate levels are indicated by 1984 proposals on bulk freight, a suggested rate per ton mile of J40 cents (8 US cents at present exchange rates) on sugar cane, 35 cents on bananas, 30 cents on fertilizer, 25 cents on cement, and 35 cents on oil.

The Financial Picture

Complete series are not available on the railway earnings picture, but in most years of the last three decades, losses have been incurred. Sample years are shown in Table 6.

Table 6

Earnings of Jamaica Railways, 1946-1984

Year	Gross Revenue	Total Expenses including Depreciation	Net Profit or Loss	Loss as Percent of Gross Revenue
	J£	J£	J£	
1946	428	653	-225	.53
1947	345	581	-236	.68
1948	338	629	-291	.86
1949	337	620	-283	.84
1950	336	702	-366	1.09
1951	357	734	-377	1.06
1952	463	845	-382	.83
1953	560	694	-134	.24
1954	919	950	- 31	.03
1955	723	1119	-396	.55
1956	773	1142	-369	.48
1957	851	1134	-283	.33
1958	778	1179	-401	.52
1959	781	1181	-400	.51
1960	784	1098	-314	.40
1961	963	1153	-190	.20
-----	J$s	J$s	J$s	
1968	2120	2951	-831	.39
1969	2395	3135	-740	.31
1970	2575	3309	-734	.29

1981	14,000	20,600	-6,600	.47
1982	12,200	21,300	-9,100	.75
1983	14,000	20,700	-6,700	.48
1984	21,300	27,400	-6,100	.29

Sources: Colonial Office, Annual Report on Jamaica, 1946-1961, Jamaica Statistical Yearbook, 1955-1982; Planning Institute of Jamaica, Social Survey of Jamaica, 1983.

The losses as a percentage of revenues are substantial, but no more so in recent years than in the late 1960s and much less than in the late 'forties and 'fifties. The losses reflect failure of the revenues from the bauxite traffic and of the passenger service (over and above passenger train operating costs) to cover the cost of maintenance of all track and overhead expenses of the system. The bauxite industry traffic is profitable as is some passenger service, but together they do not cover all remaining costs. Projections by the railway in 1984 indicate hope that the deficit can be eliminated by 1987.

The losses have been made up in part by outright government subsidy, but in large measure by borrowing from the government--though not always called this. The accumulated loss is about J$ 35 million.

The General Picture

For several years following the peak year of 1978, the fortunes of the railway declined. Passenger traffic fell as service was reduced and became less reliable, and general freight declined further. Since 1983 major improvements have been made in track and through acquisition of new equipment, and traffic has risen. But the railway is heavily dependent upon the bauxite industry.

Out of the preliminary review in this paper come several major tentative conclusions:

First, the railway is vital to the bauxite industry. Despite recent problems of the industry, there is prospect for increased bauxite traffic. Retention of the railway and improvements are imperative for the industry.

Secondly, the passenger service serves important functions to the persons using it, in providing low cost transport and in lessening congestion on the

overcrowded roads. The railway has been highly successful in retaining passenger traffic when it is able to supply adequate service.

Thirdly, the railway offers potential for shifting some of the bulk traffic off of the roads, lessening the congestion and the hazards to automobiles.

In general, the railway plays an important role in the transport field, and in conserving foreign exchange through lessening total demand for imported fuel. The railway is a valuable asset to Jamaica, one that is under-utilized while roads are overutilized.

On the basis of these conclusions, several recommendations are offered:

1. The railway should most certainly be maintained, including the entire line to Montego Bay.

2. Serious consideration should be given to restoring service from Bog Walk to Buff Bay, and ultimately to restoring the washed out portion of the line to allow resumption of service to Port Antonio.

3. Not only should the railway seek to develop general freight traffic, but the government should encourage the government corporations to shift to the railway for bulk traffic when the rates are reasonable.

4. The government should take measures to ensure that foreign exchange is available for spare parts, and for additional equipment as needed.

The basic difficulty in the way of an effective railway program is the deficit the railroad encounters. There is great merit in seeking to reduce this through increased traffic and through further economies in operation, but not through significant increases in charges to the bauxite industry or to passengers, because it is desirable to preserve as much traffic for the railway as is economic, to hold down cost per ton mile, lessen deficits, and maximize externality benefits. The government is of course under pressure,

internally, and by the World Bank and the IMF, to reduce expenditures and the deficits of public corporations. But this should not be done at the expense of services that, if eliminated, would result in increased foreign exchange drain, increased road congestion and demands for widening the roads--a very difficult and expensive task in much of Jamaica, and ultimately higher overall government spending. This was recognized in the 1978-1982 Economic Plan, as shown by the statement: "the energy crisis has necessitated a more detailed examination of its (the railroad's) potential contribution to the transport system." (p. II;96). The worldwide energy crisis may be less acute in 1985 than it was a few years ago--but this may be temporary--and Jamaica's foreign exchange problem is no less severe.

When the railway operates justifiable services that are unprofitable, the go ment should provide a direct grant, to lessen the reported deficit. The railway indicated its own goals to include rebuilding of confidence in the railroad, including general freight and passenger traffic, eliminating the operating deficit, and improving employee relations. It is recommended that the govern- ment facilitate attainment of these goals. At the same time the government should for the time being recognize the deficit, and advance funds to cover it each year so long as it exists, rather than lending--which simply builds up the railway's debt to the government. The government should recognize that the deficit is warranted by the contributions the system makes to the economy and the foreign exchange situation.

The experience in Jamaica has significance for other developing countries as well. One is the contribution that a railway can make for passenger travel, providing more satisfactory and cheaper service than the typical minibus service in developing countries, and, of great importance,

in lessening congestion on the roads and demand for road improvements, a very expensive undertaking in countries such as Jamaica. But the railroad also, despite its short hauls, demonstrates the importance of rail transport for bulk traffic, and as a means of lessening congestion on the roads for bulk freight. Acceptance of deficit on a railway may in the end be far cheaper, in terms of government spending and foreign exchange, than abandonment. A deficit is not evidence of inefficiency or lack of economic justification.

In evaluating the economic justification of continuation of a railway line, a line is justifiable if the costs for which the line is responsible, including a return on salvage value and on new investment in the line and equipment as it is made, are covered by the sum of:

1. Revenues from the line.
2. The additional revenue that could be obtained if:
   a. fares were raised to optimal profit levels, but are held below these figures for equity reasons.
   b. freight revenues were raised to optimal profit levels, but are not for reasons of economic development and encouragement of exports.
3. The externality gains from lessening of road congestion, in the form of savings in time and frustration, and fewer accidents, and lessened expenditures on road maintenance and construction.
4. The gains to the economy from additional employment generated.
5. The foreign exchange savings, from lessened importation of petroleum and motor vehicles and parts, adjusted for the foreign exchange required for the railway.

It has not been possible in this preliminary survey to quantify these elements, but they are obviously of substantial magnitude.