

1937

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KENYA - UGANDA RAILWAY & HARBOURS

~ EXPERIMENTAL RAIL CAR SERVICE

Previous

Subsequent

R. 297 8/1/37

R. 309 15/2

in Duru 15/2

in Duru 16/2

297 7/1/37

R. 309 12/4

R. 297

C.I.

1. HIGH COMM. TRANSPORT.....CONF.....24.12.36.
Trs. copy of Memorandum circulated to Railway Advisory Council. (Orig. regd. on 38179/19/36)

TRANSPORT.
(K.U.R)

Registered in accordance with instructions
on 38179/19/36 Kenya.

? Put by

[Signature]

R.297
6.2.37.

see

Smith 12/17
McKinnell

15/2/37

Roberts 15/2

[Signature]
16/2

3 PN. REGD. ON
38179/19/37

2. SEC. HIGH COMM. FOR TRANSPORT.....3 PN.....31.5.37.
Trs. copies of memo. on Experimental Rail Car Service.

Registered for
38179/19/37
see

Put by
[Signature]
17/9/37
[Signature]

[Signature]

Encl. to Gov. of 31.5.37 regd. n. 38179/19 37

MEMORANDUM FOR RAILWAY ADVISORY COUNCIL.

EXPERIMENTAL RAIL CAR SERVICE.

With reference to Minute No. 1096 of the meeting of Council held on 17th February, 1937, the question of introducing an experimental rail car service on the Kisumu - Yala Line and the Jinja - Kampala section has been investigated.

2. The attached report, etc., prepared by the Superintendent of the Line, covers the results of these investigations.

3. It is considered:-

(a) That any experimental service should, for the reasons set out in the report, be undertaken by the smaller unit of the Walker diesel engine type;

and

(b) That the initial test should be made on the Jinja-Kampala section.

4. A copy of the views of the Uganda Government on the principle involved is attached.

5. For consideration by Council.

Ref. No. R. 9/329.

GENERAL MANAGER'S OFFICE,
NAIROBI.

14th April, 1937.

COPY.

OFFICE OF THE SUPERINTENDENT OF THE
LINE, NAIROBI.

No. T.25/50/36

8th April, 1937.

The Hon. the General Manager,
Thro' the Chief Accountant,
Kenya and Uganda Railways and Harbours,
NAIROBI.

EXPERIMENTAL RAIL CAR SERVICE.

With reference to your letter No. A.9/329 of the 7th December last, two main avenues of enquiry have been opened up in this letter with which I will deal separately.

I.

Type of Car.

1. Since the question was first raised, considerable thought has been given, both by the Chief Mechanical Engineer and myself, as to the best type of unit to adopt for the proposed rail car service. Protracted correspondence has been exchanged with various makers, in order that we should be equipped with all possible data, and discussion has finally centred round the adoption of either of the following two vehicles:-

1. Sentinel engine of a light train set.
2. Walker rail coach with a diesel engine.

I attach copy of a letter from the Chief Mechanical Engineer with schedules, in which he examines in detail these two units, setting out capital cost, fixed charges, running costs and performance. So far as costs are concerned, the important figures (per unit) are as under:-

| | Capital Cost | Fixed Annual Charges | Maintenance & Operating Costs | Total Annual Charges | Cost per Car mile |
|----------|--------------|----------------------|-------------------------------|----------------------|-------------------|
| | £ | £ | £ | £ | |
| Sentinel | 3,130 | 1,211 | 2,916 | 4,127 | Shs. 1.31 |
| Diesel | 4,100 | 588 | 456 | 1,044 | Cts. 33.143 |

Apart from the difference in first cost, which in the case of three units represents a saving of £6,000 in favour of the Diesel, the fundamental factor which emerges from an examination of the figures is the great disparity between the total annual charges and particularly the percentage which the running costs bear to the fixed charges in each case.

ii. The Chief Mechanical Engineer has rightly pointed out that on a cost per seat-mile basis the relative figures are : Sentinel .862 cents; Diesel .663 cents, and on this ground, together with the known reliability of the Sentinel engine with its large reserve of power, he strongly favours the adoption of that unit.

iii. If the principal object to be aimed at were the provision of the greatest possible daily seat mileage, then, doubtless, great weight would attach to the claims of the Sentinel. We have, however, to have regard to the potentialities of the traffic which we have in view and to decide which of the two cars will provide us with an adequate daily seat mileage at the minimum of expense.

iv. We are faced first of all with the fact that we are discussing an experiment; that we will be operating where road transport is already well established at low fares; that we will be competing with all the disadvantages of a unit which is tied to the railway and lacks the flexibility of motor transport. I cannot think, therefore, that we will be called on to cater for large numbers in our trip. I imagine that what we will have to cater for is comparatively small numbers on a trip with a frequent service. To provide a sufficient daily seat mileage for the traffic I have in view, there are two alternatives:- (a) a large unit doing a small mileage, or (b) a small unit doing a large mileage. And if I am correct in my estimation of the traffic, the huge difference between the running costs of the two vehicles assumes great significance. With the Diesel car, it will be seen that a much larger proportion of the charges are fixed, while the running costs are relatively low. The more substantial the mileage scheduled, the more economical the running. On the other hand, with the Sentinel, expenses mount up rapidly with additional mileage.

v. If there were a reasonable prospect of filling a fair percentage of the available seating accommodation on the Sentinel, the case would be different; but the travel habits of the Native have been moulded by road transport giving great frequency of service with a small unit, and he is not accustomed to travel in large numbers at long intervals. If I have correctly appraised the situation, traffic development is more likely to take place as a result of a frequent service of small cars. Another vital factor is that the very low costs per car mile will allow us to lower the fares if necessary.

vi. To my mind, the most trenchant argument against the Sentinel is that we are turning away from the principle of the small, light, cheap-running unit towards the train, with its increased operating costs and reduced flexibility, and this could only be justified if a heavy passenger traffic was in view. Seating capacity can be purchased too dearly if the percentage unoccupied is likely to be high.

vii. On the figures, as presented in the schedules prepared by the Chief Mechanical Engineer, and in view of the nature of the traffic, I think we should adopt the light unit of the Walker Company's design, modified so far as seating is concerned to suit our requirements, and I recommend accordingly.

II.

Possible Routes.

i. I have been asked to give consideration again to each of the possible routes - Jinja-Kampala or Kisumu-Yala-Butere. I attach 14 copies of population maps of the areas concerned. Either of these sections would, in my view, present a suitable field for the operation of the rail car service. They both have the requisite density of population and doubtless both will be served by rail cars when the present experiment is proved.

ii. There is probably more money circulating amongst the Natives in the Jinja-Kampala area and the presence of a definite movement between the two large centres, Jinja and Kampala, in addition to the greater proximity of the line to the Native villages, makes this section, to my mind, more attractive. We would meet in this section with more intense road competition, but in spite of this, I think this is the section where we should first experiment.

iii. On the Jinja-Kampala section, we might expect to get a fair proportion of passengers making the whole journey of 57 miles. On the Butere branch, the bulk of the travelling would be between Kisumu and Yala, a run of 32 miles. This would appreciably affect our revenue prospects, and I recommend that the first trial be made between Kampala and Jinja.

(Signed) F. BROWNING.

SUPERINTENDENT OF THE LINE.

AD/WJH

COPY.

CONFIDENTIAL.

No. N.60/1/16

CHIEF SECRETARY'S OFFICE,
ENTEBBE, UGANDA.

3rd April, 1937.

S i r,

I am directed to refer to my Confidential letter No. N.60/1/4 of the 30th December, 1936, with regard to the proposal of the Kenya and Uganda Railways and Harbours Administration for the inauguration of an experimental Rail Car Service on the Lines Jinja-Kampala and Yala-Butere.

The Mans Report having now been received, I am to say that this Government desires to raise no further objection to this proposal as far as it affects the Jinja-Kampala line on the understanding that the service would be for passengers exclusively and would not affect the present position regarding the transport of goods and further that the Government of Uganda is not in a position to give an undertaking that such a service would be protected from competition from road transport interest.

I have etc.

(Signed) J.E.S. MERRICK

CHIEF SECRETARY.

THE SECRETARY TO THE HIGH COMMISSIONER FOR TRANSPORT,
NAIROBI.

MEMORANDUM FOR RAILWAY ADVISORY COUNCIL.

EXPERIMENTAL RAIL CAR SERVICE.

In Minute No. 1071 of the meeting of Council held on 21st/22nd October, 1936, Council asked that consideration should now be given to the introduction of an experimental Rail Car Service over some suitable section of the line.

2. This is a matter which has received close study over a period of years and developments in Rail Car design and efficiency have been carefully watched. While instructed opinion, notably in South Africa, is not fully satisfied as regards the most efficient mechanical design, it is an undoubted fact that a large number of vehicles are running successfully in many parts of the world and reasonable reliability can now be assured.

3. Apart from the mechanical difficulties, other factors, such as -

- (i) Lack of sufficient population within reasonable distance of the Railway.
- (ii) Lack of direct rail access to centres of population, villages, etc.
- (iii) Necessity for avoiding interference with more important and more lucrative goods services, which cannot be overcome without expenditure.

N.B. This applies principally to main line projects.

- (iv) Difficulty of ensuring a reliable passenger service, owing to a preponderance of goods trains which cannot run to an exact schedule.
- (v) Limited number of services that can be provided at reasonable, the severity of curves and grades necessitating comparatively slow schedules.
- (vi) Lack of funds has also precluded the adoption of experimental services of this type, which might prove unsuccessful.

have hitherto militated against the successful operation of Rail Car Services. The financial position has, however, now sufficiently improved to remove this particular difficulty.

4. Mr. Dalton, Assistant Superintendent of the Line, who has had experience with this type of service in Tanganyika, has submitted a report, which is attached hereto. The following comments on the report are submitted for consideration:-

(a) Selection of Route:

Various sections of the Railway have been examined in this connection during recent years, notably Mombasa-Mazeras, Nairobi-Thika-Fort Hall, Yale Branch, Thomson's Falls Branch and the Jinja-Kampala section. After full consideration, it is felt that the Jinja-Kampala section is the most suitable one for an experiment of this nature, chiefly on account of the large native population in that

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neighbourhood and because the bulk of the population lives within reasonable reach of the Railway alignment.

(b) Type of Rail Car:

It is agreed that the diesel-engined type car recommended in the report is likely to be the most suitable for our conditions. It also is agreed that two classes only should be provided. If further classes are attempted, it will lead to additional cost and much waste of space.

(c) Service:

The projected service of only three trips in each direction during daylight hours is the maximum that can be scheduled, even with the opening of the three additional crossing stations which will be necessary. This illustrates clearly one of the difficulties which we have to face with a single line. From the standpoint of the public, the chief advantage of rail car services lies in the frequency of the service provided. It is questionable whether a limited service of the nature possible in this case is likely to be attractive or useful, but this can only be established by experience.

(d) Fares:

The suggested fares are lower than the new standard fares, which will be introduced on the 1st January next. The reason for quoting lower fares is to approach as near as possible to the fares charged by the road services. The introduction of the lower fares for the Rail Car service may eventually force down the ordinary fares in this section to the same level.

(e) Financial Aspect:

This will require further detailed examination before definite figures can be accepted. It is obvious, of course, that there will not be any large increase in Nett Revenue Account, but the object of the experiment is to provide a facility that will be of benefit to the general public, while not involving the Administration in actual loss. If such a service is adopted, it is not considered that the Railway Administration should claim particular protection against road competition, but it is assumed that Government will see that legislation on the lines recommended in paragraph 24 of the Report of the Road Accident Committee of Uganda, dated December, 1935, will be enacted. As the suggested service is in the nature of an experiment only, it can be undertaken at the present time only because our finances are in a sound position.

The two most serious handicaps to be encountered are:

- (i) The more frequent and convenient service that can be provided by road;
- (ii) The fact that centres of population generally are nearer to the road than to the Railway.

(f) Conclusion:

This question is submitted to Council for consideration. It is believed that the time has arrived for a limited experiment of this nature, although, as has been explained

above, no material financial benefits are likely to accrue to the Administration. Further, it must not be overlooked that the Railway was built primarily for the carriage of goods and if the tonnage passing between any two points increases to a large extent, the operation of a Rail Car Service, as already explained, must be attended with ever increasing operating expenditure, owing to the need for additional crossing stations, etc. It will be realised that any Rail Car Service, however well patronised, is a nett revenue earning unit of low capacity as compared with a freight train, even after making allowance for its shorter occupation of the track and more economical running costs. It follows from these considerations that, particularly on main line sections, the time may come when the Rail Car Service would have to be withdrawn to accommodate increased goods traffic, or, alternatively, the track capacity would have to be increased by the multiplication of crossing stations.

For consideration by Council.

Ref. No. A. 7/332/41.

GENERAL MANAGER'S OFFICE,
NAIROBI.

25th November, 1936.

16th November, 1936.

MEMORANDUM ON RAIL CARS.

Introductory.

The value of rail cars as a factor in combating road competition, and as a means of providing a convenient passenger operating unit of low running costs, is becoming more and more recognised, and almost every railway system in the world is endeavouring, to a greater or less extent, to substitute, or to augment, certain types of steam train services with a unit which can provide the faster and more frequent services which are imperative nowadays if passenger traffic is to be attracted back to the railroad. Out of this need has been evolved the modern rail car - whether steam, diesel or petrol driven - the value of which has been amply demonstrated in one country after another.

I will not refer here to the remarkable development of rail car services which has taken place in Europe and America, conditions being in no way analogous to those in a tropical Colony. I might refer, however, to the Egyptian Delta Railways, on which the purchase of one rail car in 1924 led to a fleet of fifty being built up in the course of the following eight years, and that Company is satisfied it has successfully met the challenge of motor transport by this means, with reduced operating costs. It might also be stated that among the steps taken by the Indian Railway systems to conserve their passenger traffic, the use of rail cars finds a prominent place; and, to move nearer home, a rail car service has been successfully operated between Tanga, Korogwe and Mombasa on the Tanganyika Railways for the past few years. This service is operating in an area most vulnerable to road competition, which had made deep inroads into the revenue of the railway, and from the outset it attested its ability - even with slightly higher fares - to attract passengers. The decline in passenger revenue was checked, an immediate upward trend was apparent and the cars are now established on a prosperous financial basis. Their popularity with the native is beyond doubt.

Possibilities on the K.U.R.

Examining the question as it presents itself on the Kenya and Uganda Railways, it is evident that two main conditions are essential for a successful exploitation of the rail car - density of population and convenience of the railway and its stations to the main villages and centres of population. Apart from the Mombasa-Mazeras section (where the problem is of a special nature) these conditions, in my view, are best fulfilled in the section Kampala-Jinja. Between these two towns there is a continuous stream of passenger traffic, the native is relatively prosperous, and the whole area is thickly populated. It has been estimated that well over 150,000 people live north and south of the railway.

The travelling needs of the people are at present well served by a first-class road along which runs a liberal 'bus service. It may be stated at once that a good 'bus

service has several obvious advantages over a rail service. But there are also disadvantages -

- (a) Lack of a regular time-table.
- (b) Lack of any statutory obligation to carry the passenger to his destination - it has been stated that passengers have, on occasion, been dumped at the side of the road (with a refund of part fare) because a larger batch of passengers had presented themselves bound for the starting point.
- (c) Safety (or, rather the lack of it).
- (d) Discomfort.

These are four advantages of considerable importance which the rail car has to offset against the greater flexibility of its competitor - regularity of service, reliability, safety and comfort.

The question whether the native will or will not be attracted from the road is not one which is possible solution by an scientific process. It can only be solved by experiment. Experience in other countries, and particularly in Tanganyika, goes to show that it is an experiment worth making. It is also probable that competition will not be entirely uncontrolled. Government's anxiety at the increasing number of road accidents is apparent, and steps will undoubtedly be taken to remove the more irresponsible and impecunious bus owners from the road and to improve the standard of service of bus design and of maintenance, all of which cannot fail to have an influence on the level of fares charged.

Type of Rail-car:

The choice lies between a steam operated unit such as the Sentinel which is in use in Tanganyika, or an internal combustion engine of the diesel or petrol-driven type. The steam unit has the advantage of being known to the staff and is very reliable on the road. Its disadvantages, however, are lack of flexibility - length of time taken to light up and place in service, time spent in washing out the boiler.

Of the two other types, we have to balance a petrol-engined car of relatively low first cost against a car which calls for a greater capital outlay but with a much lower operating cost. This question has been discussed at length with the Chief Mechanical Engineer and his advisers, who are unanimously in favour of a diesel-engined car, because of its greater reliability, its reserves of power, its longer life, and, of course, its lower running costs. They are against, too, any lightly constructed chassis and coachwork which, though of initial low cost, may prove to be false economy in the long run, and which are not likely to give that comfort and steadiness on the road which is possible with a more expensive and solidly built car. The diesel car would also have the advantage of a greater range, and, if not successful in one section, could be tried out in others.

I am, therefore, of the opinion that we should select a diesel-engined rail car, capable of maintaining at least 25 miles per hour on a 2% grade and up to 40 miles per hour on the level (speed limit 35 m.p.h.), with accommodation for 50 to 55 third-class passengers and 6 to 8 upper-class. Steadiness and smooth riding would be essential.

Three units of this type would be necessary to open a service of the nature contemplated.

Service.

As will be seen from the financial statement, while the fixed annual charges will be heavy, running costs will be low. It behoves us, therefore, to schedule as substantial a mileage as possible. The time table which would eventually be decided on would be the result of a close analysis of the trend of native traffic. For the present, however, I assume a service of three trips a day in each direction, something on these lines^x

DOWN

UP

| | | | | | | | | | | | |
|------------------|-------|---|-------|---|-------|------------------|-------|---|-------|---|-------|
| Kampala (depart) | 8.00 | : | 11.30 | : | 16.20 | Jinja (depart) | 8.00 | : | 12.20 | : | 16.45 |
| Jinja (arrive) | 10.25 | : | 14.10 | : | 18.56 | Kampala (arrive) | 10.48 | : | 14.46 | : | 19.16 |

subject to the Chief Engineer's agreement on the following basis -
 35 m.p.h. on level : 1.3 to 1.7% 30 m.p.h. : 1.8 to 2.0% 25 m.p.h.

Any extension of this service which is possible will increase profits, for the cost of individual trips will be very small.

Fares:

Fares will have to be on a competitive basis. These are what I propose -

Third Class.

| | | | | | | | |
|--------------|---------|--------|------|------|--------|----------|--------|
| Kampala | Kampala | | | | | | |
| Mukono (16) | -/60 | Mukono | (15) | -/60 | Kawolo | (8) | -/30 |
| Kawolo (31) | 1/20 | (23) | -/90 | (8) | -/30 | Lubanyi! | |
| Lubanyi (39) | 1/50 | (42) | 1/60 | (27) | 1/00 | (19) | -/70 |
| Jinja (58) | 2/10 | | | | | | Jinja. |

Upper Class.

| | | | | | | | |
|--------------|---------|--------|------|------|--------|----------|-------|
| Kampala | Kampala | | | | | | |
| Mukono (16) | 2/20 | Mukono | (15) | 2/10 | Kawolo | (8) | 1/10 |
| Kawolo (31) | 4/20 | (23) | 3/20 | (8) | 1/10 | Lubanyi! | |
| Lubanyi (39) | 5/30 | (42) | 5/80 | (27) | 3/70 | (19) | 2/90 |
| Jinja (58) | 7/90 | | | | | | Jinja |

Bracketed figures - miles

It will be appreciated that if there was any regular passenger traffic between Jinja and Kampala on the ordinary trains at existing fares it would promptly be attracted to the lower and speedier rail car service. As, however, this traffic is a negligible quantity, the point does not merit consideration.

Financial Statement:

In order to provide the additional service, three stations, at present closed, will have to be re-opened, and as there are no buildings or offices at the sites, the capital expenditure has to be increased to make provision for these.

The cost of the unit is not definitely known, but information received from the local agents of Armstrong-Whitworth gives ground for believing that three cars of the type required could be purchased at a cost of £7,000 each, assembled Nairobi. On this basis the financial statement would be:-

Capital Cost:

| | |
|--|---------------|
| | £ |
| Cost of Cars at £7,000 | 21,000 |
| Cost of fuelling equipment | 100 |
| Cost of equipping 3 stations at £750 | <u>2,250</u> |
| Total Capital Expenditure | 23,350 |

Fixed Charges:

| | |
|---|--------------|
| | £ |
| Interest Charges at 6% | 1,401 |
| Depreciation on cars (15 years' life) | 1,400 |
| Depreciation on fuelling equipment (20 years' life) | 5 |
| Depreciation on station buildings (30 years' life) | 75 |
| Wages of extra station staff (£114 per station) | <u>342</u> |
| Total fixed annual charges | 3,223 |

Running Costs:

| | |
|---|--------------|
| | £ |
| Mileage per annum 124,830 | |
| Fuel Costs (@ 8 miles per gallon & 42 cents per gallon) 328 | |
| Lubricating Oil (@ 500 " " & Shs. 3/84 " ") 48 | |
| Maintenance (@ .785 £. per mile) | 408 |
| Wages of Running Staff | <u>400</u> |
| Total Running Costs | 1,184 |

TOTAL ANNUAL COSTS £4,407

Revenue:

It will be seen from the foregoing that the total annual charges which have to be met amount to £4,407. The cars will do 2,190 trips in a year, so that takings amounting only to Shs. 40.25 per trip will suffice to make the venture a success. A smaller and poorer population on the Tanga Line produced, in 1935, an average of Shs. 76.33 per trip over 1353 trips. That figure is being considerably increased during the present year. During 1933 some 170 people travelled daily between Kampala and Jinja according to a Police Report. Bearing in mind the great increase in prosperity since that year it does not seem unreasonable to estimate for a daily movement of 250 people, and this might be expected to increase with the inducement to travel provided by the service now under discussion.

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If 20 to 25 natives use the cars per trip, of whom 15 travel the whole journey, with, say, an average of .66 upper class passengers per trip, a revenue of (approximately) Shs. 43/00 would accrue and I do not think it is unreasonable to expect an average earning of at least Shs. 45/00 per trip.

General:

I do not pretend that the rail car scheme thus outlined will result at first, even if moderately successful, in any striking contribution to net revenue. At the best, a few thousand pounds is all that can be hoped for. The experience gained, however, will be invaluable and the publicity value is not to be ignored. It is not improbable, too, in the course of time, with advancing prosperity amongst the natives, that a much wider field of revenue may be opened up, which can only be tapped and developed by experiment along the lines now suggested.

(Signed) A. DALTON

ASSISTANT SUPERINTENDENT OF THE LINE.
