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The development of roads and road transport network in Southern Rhodesia, 1945-1965

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Abstract: This paper aims to examine the development of roads and road transport network in Southern Rhodesia (now Zimbabwe) from 1945 to 1965, a period often overlooked by scholars especially considering the fact that an ambitious and comprehensive road construction and maintenance programme was embarked upon soon after the Second World War. This was occasioned by the colonial government's realisation of the acute need to penetrate further into the interior of the country in an effort to accommodate the increasing numbers of white immigrants inundating the colony for resettlement purposes and to speed up economically extractive endeavours. Although some scholars hint that road construction during this period was intended to make these resettlement areas more accessible, they often gloss over the role played by the Responsible Government which reserved funds for the construction and maintenance of the colony's trunk roads from as far afield as Beitbridge to Umtali through Bulawayo and Salisbury. The paper argues that such infrastructural developments were a microcosm of bigger reconstruction and developmental projects in post-war Europe and should not be read in isolation. Arguably, by 1965, relative improvement had occurred in the state of roads in the country, especially given that most of the strip roads had been replaced by full-width tarmac highways in addition to all-weather bridges erected over some wide rivers. The main methodology for data collection for this paper is archival based, while interviews will be held with various stakeholders in order to complement the primary data from the archives.
Keywords: Road construction and maintenance, all-weather highways, transport, traffic

INTRODUCTION

The history of road development in Southern Rhodesia is traced back to the pre-colonial times, during which period these were mere paths. The frequency of use of such paths by both Africans and animals alike determined the visibility of the 'roads' and their potential to develop into a 'main roads' [7].The wagon track cutting through the bush during the Pioneer Column's march on Mashonaland in 1890 became the first to resemble a road, following which was the Moodie Track established in 1892 which ran from the Victoria Falls to the Eastern Highlands [1]. The creation in 1895 of the Roads Department through the Public Works Department resulted from efforts to construct and maintain better roads for the colony, although the implementation of its objectives was fraught with financial constraints[6].

Settlers, however, continued to clamour for improved roads, prompting the Roads Department by 1919 to appoint an Engineer-in-Charge of Roads who was to oversee the construction and maintenance of roads [9]. This was also coupled with the establishment of Road Councils in 1923 to improve gravel roads already in existence. The overall aim by 1928 as articulated by the Chief Road Engineer, Stuart Chandler, was to get 'all-weather' roads throughout the country which would always be strengthened afterwards to bear ''increased traffic where warranted''. [1] The challenge of insufficient funding by the British South Africa Company (BSAC) still persisted as evidenced by the purchase in 1930 of only two caterpillars for both maintenance work and the grading of new roads.

In an effort to prevent corrugations on gravel roads caused by heavily-laden vehicles with narrow tyres, tar spraying was recommended although it was quickly abandoned in favour strip roads which proved to be less costly.[2] The lifespan of concrete strips was, however, short especially because heavy vehicles tended to destroy their edges while at the same time clouds of dust rose up as vehicles came off the strips to pass one another. Drivers also complained of the discomfort that concrete strips posed as a result of the blinding glare in strong sunlight. Before disbanding the strip roads and replacing them with asphalt in 1933, the

[1] Annual Report on Roads by the Chief Road Engineer, 1928.
[2] NAZ, S481/169, Divisional Road Engineer of Gwelo to the Chief Road Engineer, 1930.

following roads had received concrete strips: Umtali-Salisbury; Salisbury-Gatooma-Gwelo; Gwelo-Bulawayo; Umvuma-Fort Victoria-Beitbridge; Bulawayo-Beitbridge; and, Gwelo-Selukwe. [3] The strength of the use of asphalt paving was seen in its capability to sustain periodic soil movements without cracking and Prime Minister, Godfrey Huggins, was quick to welcome it on coming to power as sufficiently demonstrated by his government's setting aside of £700, 933 for the completion by 1937 of 1, 182 unbroken miles.[4]

Nevertheless, the asphalt strips, like the concrete ones, gave in to the weight of lorries while their verges could not fully withstand heavy rains; hence, requiring them to be continuously refurbished. Indeed, by the outbreak of the Second World War in 1939 and its attendant demand for increased and faster traffic, the resilience of the roads to pressure diminished. In the wake of such unprecedented problems of road wear, Mlambo [6] sums up how the Responsible Government contemplated constructing durable and wide tarred roads:

> *Consequently, the strip roads which, before the war had been hailed as the ultimate solution to Southern Rhodesia's road problems, were, by war's end, found to be grossly inadequate. To cope with the new post-war traffic needs, a programme of road construction, using conventional bitumen was started in 1946 as the country entered yet another phase of road construction, improvement and consolidation (1994:23).*

Even though the country had the basic infrastructure, the roads still lacked some of the basic engineering technology, a position that received eventual recognition in 1946.

DEBATES LEADING TO THE DEVELOPMENT OF ROADS AND ROAD TRANSPORT

THE ROAD AND RAIL TRANSPORT COMMISSION OF 1940

The terms of reference for the Road and Rail Transport Commission (1940) were to inquire into, and consider, the nature and extent of the competition between the transportation of goods by road and rail.[5] It was to advise whether such transport had to be regulated and if road transport could be used as a complementary infrastructure to railway transport.[6] The findings of this commission were to be an important factor in the development of roads and road traffic in Southern Rhodesia.

One of the complaints raised by railway users was in connection with relatively high rates of transportation of goods. For instance, one farmer had this to say:

> *The scale on which some railway rates operate under some conditions on certain commodities is such that the only remedy left to the producer is road transport. For instance, this year my leaf tobacco sold on the Auction Floor for an average of 9d/lb. The rail age rate on this from Shamva to Salisbury is £11.6d.85/£100, which is one third more than that of road transport. Leave road transport free as it is at present....*[7]

According to the evidence gathered from the respondents to the Inquiry, road transport would also bring an end to the unlegislated monopoly enjoyed by railways. One of them, J.W. Downie puts this argument more succinctly, that "we have always looked down upon it that it is against the interests of the country that a monopoly should be granted. The reason why people use road transport is that they get "door-to-door" delivery."[8]

The Road Motor Service alone was unable to cope with the demand without other private players. For instance, the pig industry performed better with the use of road transport since pigs were taken straight to the abattoir for slaughter on the same day. Using railways, they would sometimes be undelivered until the following day. The loss of weight when conveyed by rail was big. Pigs were hauled from Fort Victoria to Salisbury by road. In the face of this evidence, Commissioner Justice Hudson, convinced William. J.K. Skillicorn, the General Manager of Rhodesia Railways, that the dominance of railways over other operators had since lost viability. These findings were useful in determining road and road traffic expansion. Considerations were taken to incorporate these views in programmes concerned with the development of transport.

THE ROADS AND ROAD TRAFFIC AMENDMENT ACT, 1948

In an effort to give an impetus to road construction and maintenance, a bill was passed in 1948. This was to amend Chapter 257 of the Roads and Road Traffic Act (1936) in relation to road construction authorities. Section 10 of the principal Act was amended as follows: "The Minister may direct a Road

[3] Report on Roads by the Chief Road Engineer, 1934.
[4] Annual Report on Roads, 1937.
[5] NAZ, S482/295/39, Road and Rail Transport Commission, 1940: Inquiry: Letter dated 4 June,1940: Secretary: Road and Rail Transport Commission to the General Manager, The Rhodesia Railways, Bulawayo.
[6] Ibid.
[7] Ibid.
[8] NAZ, S482/123/48, Road and Rail Transport Commission (1940): Evidence: 4 June, 1940.

Council within an area to maintain, or construct and maintain, within such reasonable time as he may fix, any road not being a main road."[9] In the event of failure by a Road Council to comply with a directive under sub-section (3) of Section 10 above, the Minister would undertake the construction and maintenance of such road. The Minister would recover any costs incurred by him in this connection from any amounts payable to the Road Council under Section 47 (Grants) of the same Act.[10]

An additional section was placed to follow Section 10. This stipulated that if the Minister thought any road within the area under the jurisdiction of a local authority constituted a danger to the users thereof, he would direct such local authority to repair, alter or reconstruct such road within such reasonable time as he would fix.[11] This measure was an attempt to minimise the deterioration of already existing roads owing to insufficient maintenance. To ensure that the roads remained safe even if responsible local authorities failed to comply with a directive under 10A (i) above, the Minister of Roads and Road Traffic would undertake the repair, alteration or reconstruction of the road in question. However, the consequences to the local authority concerned were painful, particularly because, "any expenditure incurred by the Minister in the exercise of his powers under sub-section (i) of the above section may be recovered by the Minister by action in any competent court against the appropriate local authority".[12] Nevertheless, it was not always a question of negligence of duty by local authorities in servicing their roads, but there were insufficient funds to do this. Sometimes, it was a result of indistinct boundaries between local authorities which led to problems of determining which local authority was responsible for running particular roads.

Under Chapter 257, Section 14, the Government also had the responsibility of helping a city or town council to bear the cost of making a road safe.[13] Similarly, the Government was expected to make a contribution towards the initial cost of construction of a new road within a city or a town. A Municipal Council could not use ratepayers' money before it fulfilled its obligations of property constructing and maintaining all roads in the rateable area.[14] In this case, most peri-urban roads existed outside the jurisdiction of municipalities. The amendments made to the Act were aimed at sharpening the focus of local authorities on their core business of constructing and maintaining roads within their spheres of influence. Progress, however, depended hugely on the availability of funds to purchase or hire equipment and personnel to transact the stated services.

ASSOCIATION OF ROAD COUNCILS OF RHODESIA

The Road Council Ordinance was promulgated in 1921 by the Company Government in a bid to encourage local authorities to contribute to road construction. It provided for the creation of Road Councils throughout the country but advised that the government had to give financial aid to such councils through a grants-in-aid system on a £ for £ basis [9]. It was not until 1923 that the first Road Council was established in Que Que [6]. One of the major reasons for this delay was the negative effect of the economic slump of the early 1920s on potential taxpayers, particularly farmers.

Throughout their existence from the mid-1920s to the early 1960s, Road Councils were generally underfunded. This had a crippling effect on their mandate to construct and maintain district roads. The Government policy towards road construction tended to focus primarily on the main roads while rendering limited support to District Road Councils as opposed to the provisions of the 1921 Road Councils Ordinance. The Minister of Mines and Works in 1930 enunciated the following Government's position:

> *The (Government's road) programme is, first of all, to take charge of the trunk roads..., the main arteries of the country....Next, the policy is to take charge of the main roads between different centres, such as Salisbury and Bulawayo, Salisbury and Umtali....Then, we give assistance to Road Councils in Road Council areas and pay on a £ for £ basis with them, in keeping up roads they themselves make.*[15]

The outcome of this government policy was to produce roads of varying quality. While the links between the central and local governments should be appreciated, roads that were funded directly by the Government were always well maintained [6]. The quality of roads under the control of District Road Councils varied with the economic status of residents of these localities.

Although Road Councils made attempts to raise some revenue using the Vehicle Tax Ordinance (1921), the Government's quota was minimal. This vehicle tax varied with the width of tyres of vehicles involved. For instance, rubber-wheeled vehicles paid

[9] NAZ, S482/123/48, Roads: Applications for Roads and Repairs: Bill: Further to amend the Roads and Road Traffic Act (Chapter 257): Article 4: Section 10, Sub-section 3.
[10] Ibid, sub-section 4.
[11] Ibid, sub-section 10A (i).
[12] Ibid, 10 A (iii)
[13] NAZ, S123/1A/3/48/3: Letter by the Mayor of Salisbury to Sir Godfrey Huggins, 9 February 1949.
[14] Ibid.
[15] Southern Rhodesia: Representation by the Secretary for Mines and Works on Roads: Presentation to the Legislative Council,1930.

less than steel-wheeled ones since they did less damage to the roads. However, in an effort to bargain for more recognition in the budget allocation from a position of strength, Road Councils began contemplating coming together towards the mid-1950s. The idea to form a central organisation to represent Road Councils was first conceived in 1954.[16] However, it was not until the 6th October, 1961, that the Association of Road Councils of Rhodesia was born.[17] On 13 August 1963, the First Congress was the need to urge the few remaining Road Councils on the Congress was the need to urge the few remaining Road Councils to join the Association to represent them.

Although this development was a unification of power at a time when decentralisation and community responsibility were the order of the day, the Government observed that it could not easily deal with Road Councils on an individual basis. According to H.J. Harper, the Minister of Roads and Road Traffic, Road Councils were 'the progenitors of Community Development'[18]. The ex-Prime Minister, Winston Field, said:

> *I have always looked upon the Road Council as the epitome of Community Development. Mr President, I hope that you will bring- I will not say sufficient pressure; I do not like that word, - but sufficient arguments to convince the Government that your case is good....*[19]

These remarks suggest how important the Association was to become in terms of its being a truly representative body in matters of road development. To this end, some resolutions were reached during the first and second congresses pertaining to roads and road traffic. For example, one of the items on the agenda of the first congress stated that the Association was supposed to approach private contractors with a view to getting specialised road-making machinery made available for hire by Road Councils. [20] The Nyamandlovu Road Council proposed the resolution, saying that expensive equipment and items in constant use were the main objects envisaged, such as tarring machinery, rollers, stone crushers, compressors, pumping equipment and heavy earthmoving machinery.[21] Since the Roads Department was in short supply of road making equipment, machinery was hired. However, this posed problems in that these machines could be hired without operators and the service thereof was the hirer's responsibility. Councils would find it uneconomic to retain employees who could operate hired equipment. In this regard, it was better to hire private contractors who sent skilled operators with their machines and undertook servicing themselves.

Another important proposal made was in connection with a Road Fund. On 16th February, 1960, a select committee on Road Financing Problems presented a Report to the Legislative Assembly in which it examined possible methods of providing funds for roads. It highlighted the need for this road fund which involved the appropriation of certain types of revenue, notably from vehicle licensing. [22] Other revenues directly associated with road users could be collected and saved through an inviolable fund, the expenditure from which would be devoted solely to road purposes. The envisaged advantage of this fund, among others, was to enable Road Councils to draw up long-term programmes of construction and maintenance.

As the debates raged on, delegates to the First Congress registered their disapproval of the Government's sudden cut in 1963 in the allocation of grants. Minister Harper explained that:

> *You are aware of the reasons for the cut in Government's contribution to Road Councils- the money was transferred to other votes and it is not easy to redress the position yet. I have spoken often on this imbalance in public spending, but at present, no matter how we alter the formula, it provides no more money and we can only alleviate the position of some councils by robbing others-a system surely calculated to cause resentment.*[23]

The Minister, however, maintained resolutely that he had no intentions to solve the problems by borrowing funds from one council to assist another. Instead, the Ministry was turning to other sources to assist Road Councils. From 1st October 1964, however, the reduction made in 1960 in the Vehicle Tax Grant due to financial constraints was restored by Treasury to £8 per annum per vehicle. [24] According to G.W. Rudland, the new Minister of Roads and Road Traffic, this restoration was aimed at convincing Road Councils that sympathy for their cause was not lacking in the Ministry of Treasury. He further pointed out that the grant on unit tax remained at 60 per cent of council's collections and the block grant remained basically the same as in 1963. The Association also welcomed the

[16] NAZ, S/AS7635, Association of Road Councils of Southern Rhodesia, Congress (Minutes)(1963)-(1965); The Council, 13th-14th August, 1963, p.1.
[17] Ibid.
[18] Ibid.
[19] NAZ, S/AS7635: The Association of Road Councils of Southern Rhodesia: Minutes of the Second Congress, Held at Meikles Hotel, Salisbury, 7th-8th July, 1965, p.2.
[20] Ibid.
[21] Ibid.
[22] NAZ, S/AS7635, Association of Road Councils: First Congress, p.2.
[23] Ibid.
[24] NAZ, S/AS7635, Second Congress, p. 5.

additional vote offered to Road Councils as reflected in Minister Rudland's summary that:

> *The Ministry of Roads has contributed from its vote enough funds to enable it to give to all Road Councils an amount of ten Shillings per mile of Road Council mileage as a gesture towards the use of Road Council roads by Public Service Vehicles, most of which are domiciled outside Road Council areas. This amount will be added to each Council's Block Grant.*[25]

Nevertheless, there was a delay in presenting a Roads and Road Traffic Amendment Bill, compounded by a succession of four Ministers of Roads and Road Traffic between 1961 and 1965.

Yet, following the reduction of grants since 1960, Road Councils taxed their ratepayers more heavily in order to bridge the gap between revenue and expenditure. Cartwright justified this hike by saying that "the road is the channel of all trade and commerce, and fundamental to social existence, and all this must stagnate unless road communications are extended in order that the country itself may be fully developed for the benefit of all citizens".[26] The following table fully illustrates the burden shouldered on ratepayers:

Table-1: Showing overall grants to Road Councils.

Year	Government grants to road councils (in British pounds)	Local unit Taxation
1950	£105, 000	£30, 000
1955	£175, 000	£99,000
1960	£226, 900	£223, 000
1963	£187, 400	£285, 000

Source: NAZ, S/AS7635, Second Congress, 1965, p. 12.

It can here be deduced that Government grants fell since 1960 by a staggering £39, 500. In the same period, Road Councils increased their Unit Taxation by £16, 100. All this was happening at a time when the Road Council mileage had increased by about 86 per cent from a mere 2,000 miles in 1950 to well over 14,000 miles by 1965.[27] There was increasing need to therefore engage the Government for it to take a more realistic attitude towards the part played by road development in the prosperity of the country and allocate more adequate funds for road construction and refurbishment.

The need for an ambitious bridge construction programme was also highlighted. At the Second Congress, requests were made for the Ministry of Roads and Road Traffic in Road Council areas to erect 'all-weather-bridges. Brigadier Andrew Dunlop, the MP for Que Que and the new Parliamentary Secretary for Roads, reiterated that any road in a Road Council area fell under the direct responsibility of the relevant Road Council.[28] This also meant that where a road crossed a river or stream, a bridge was as necessary a part of the road as the track leading up to and beyond the bridge. However, if a Road Council had neither constructed nor maintained a road or bridge in its area, but which was the responsibility of no other road authority, then the council could not be held liable for damages from an accident attributable entirely to the poor state of that road or bridge. [29] In other words, councils were exonerated in the event of mishaps as long as they were not responsible for constructing or maintaining bridges or roads causing such occurrences.

From the range of the debates above, it can be seen that many problems affected the pace at which road construction and maintenance programmes were progressing. A key to many of these challenges confronting Road Councils in Southern Rhodesia lay in the absence of adequate funding and road classification. The Government's reduction of grants in 1960 worsened the situation altogether. Nevertheless, the formation of the Association f Road Councils of Southern Rhodesia in 1961 renewed efforts to negotiate for sufficient funding from the Government.

ROAD CONSTRUCTION AND MAINTENANCE-MAJOR HIGHWAYS, URBAN AND RURAL ROADS

Since the country's road system had fast deteriorated because of the Second World War, a schedule for road refurbishment was quickly drawn up immediately after the end of the war. Southern Rhodesia was, thus, on "the eve of the greatest road development in the Colony's history"[5]. Sir Godfrey Huggins added that, "for real development, we require more and better roads".[30] In accordance with the new road development policy provisions of 1946 announced by the Minister of Mines and Public Works, G.A. Davenport, the colony was to have four types of new roads. These would be classes "A", "B", "C" and "D", depending on their carrying capacities.[31]Hence, in 1946, the Government accepted a proposal from the Roads Department for a ten-year programme to undertake the reconstruction of main roads and to provide for full-widths of asphalt surface.

Part of the ten-year plan (1946-1956) was to make access between important points as easy as

[25] Ibid.
[26] Ibid.
[27] Ibid.
[28] Quoted in ***The Rhodesia Herald***, 8July, 1965, p. 5.
[29] Ibid.
[30] NAZ, S/AF 45, The African Market, September, 1947, p. 19.
[31] Quoted in R.L. Mitchell, "Rhodesian Road Development", p. 19.

possible. For example, the distance between Umtali and Bulawayo, would be considerably shortened. According to Davenport, the secondary feeder roads were to be the responsibility of the Roads Department to construct only to the standard decided on. Until that construction started, the roads would be the full responsibility of the Road Councils and, on completion, would be handed back to the Road Council concerned for maintenance.[32] The same design wheel load as was adopted for the provincial roads in the Transvaal, the adjoining Union Province, was to be considered in Southern Rhodesia.

However, it was going to be impossible to tackle all roads at once, although all principal secondary roads were to be dealt with in the first five years, (1946-1951). It was necessary to have a big concentration of machinery in one are at one time to ensure efficiency. Nevertheless, in the first phase of construction, the Government was slow at bridge and culvert construction. There had been a shortage of cement until much later when it eventually became more plentiful to allow for the Government to replace low-level bridges with high-level ones on main and primary feeder roads. All the culverts and grids would be wide enough to allow two vehicles to pass each other.

According to R.L. Mitchell [5], "road engineering was no longer a matter of 'rule of thumb' practice, but it had become a highly specialised branch of civil engineering". Expertise and specialisation in directing road construction were needed. The Government of Southern Rhodesia recognised this fact and the engineering staff of the Roads Department was now a more qualified lot than before. This technical development was illustrated by the setting up of a Central Roads Laboratory in 1947 and a contemplation of a further four mobile laboratories years later. As opposed to most of the roads used, especially in the Company period, which were described as 'unsurveyed', 'undesigned' or 'innocent of any professional engineering' [7], that was more widespread use of technical expertise in road construction after the Second World War.

Basing on scientific research, the pace at which more efficient highways were laid out was quickened. Between 1945 and 1965, the Roads Department borrowed heavily from overseas research findings in terms of skill. The cheapest method of making roads, as was the case in the United States of America and South Africa, for instance, was generally to stabilise the soil as it occurred. W.H. Campen of the Omaha Testing Laboratories, reviewed the methods then in use to impart durability and strength to soil mixtures in road bases. He considered the selection, proportioning and mixing of soils [5]. Soil aggregate mixtures, water control in respect of duration and compaction, field control tests, preparation of subgrade and soil pavements compaction methods, were other procedures followed. These were useful methods to ensure better roads and were worth borrowing.

Southern Rhodesia was quick in embracing such technologies, so much that in 1949, J.H. Durr was immediately appointed Chief Road Engineer to take the country into an era of impressive achievements in modern road construction and maintenance within the shortest possible period.[33] The proposed design method was to be based particularly on the California Bearing Ratio, a method which evolved in the California State Highways Department where samples of soils were tested in laboratories for their resilience. In Southern Rhodesia, soil samples were sent from proposed road locations to the Central Roads Laboratory where their strength was determined.[34] From these scientific tests, the best gravels were chosen and the requisite thickness was calculated, together with the optimum moisture content at which they were to be rolled in the field.

The Roads Department prioritised the development of major highways in line with the objectives of the first five-year road construction and maintenance programme. By 1950, the use of field surveys for the main arterial highways had already begun as well as the planning of the re-alignment of such roads to modern standards. The main road system was to be completed from end to end, beginning with the Beitbridge-Bulawayo-Gwelo-Gatooma-Salisbury-Marandellas-Rusapi-Umtali one.[35] Funds were released to that effect although at times they were in short supply. However, with the formation of the Federation of Rhodesia and Nyasaland in 1953, more funds to the overall tune of £1, 500,000, were availed for road construction, prompting Southern Rhodesia to renew its efforts at implementing the comprehensive programme of road improvement.[36] The most important undertaking was the reconstruction of the Beitbridge-Umtali main road, beginning in 1949 until its completion by the middle of 1954.[37] Elsewhere, the strips were being replaced by a bituminous mat of a minimum width of 9 feet on a 32-foot road. Simultaneously, low-level bridges were being replaced with high-level ones such as the Lundi, Tokwe, Beitbridge and Victoria Falls

[32]When a road was finished, it would be handed back to the Road Council concerned as their responsibility for maintenance. However, the road would remain the responsibility of the Road Department if it was of sufficient importance to warrant Class "A" or "B" construction.

[33] NAZ, N-Z, Federal Archives Inventory Post 1923: Transport.
[34] Ibid.
[35] NAZ, S482/123/48, Road Programme: Construction and Maintenance, 1949.

[36] NAZ, S/AF75, Southern Rhodesia's Road Programme: Improvements to Keep Pace with Economic Expansion (in Africa World, January 1954), p. 25.
[37] Ibid.

bridges that would not be overtopped by flood waters[2].

In some cases, records showed that very exceptional flood levels would make the construction of a high-level bridge prohibitively expensive. Across such rivers, the bridges were constructed in such a way that they would be able to withstand any danger brought down by a river, especially in contexts of floods. The flooding might occur only once in many years and the bridges would probably be overtopped only for a few hours [2]. Generally, most travellers from the South preferred the road into Southern Rhodesia which passed through Bulawayo as it was fully surfaced with tarmac except for a few miles in course of construction. Indeed, by 1954, this particular highway presented no river hazards following the erection of new bridges along its entire length from Beitbridge to Bulawayo. The story was the same to the north and to the east of the colony. The Great North Road to Chirundu was upgraded from 1956 and was no longer as dusty and bumpy as it previously was while the Umtali to Salisbury one was, by 1965, a fully tar-macadamised highway, with every river on it spanned by 'all-weather' bridges.[38]

For most of the roads constructed or maintained, several features were added, among which were lay-bys and trees planted at intervals. Reasons for these initiatives were varied, but besides beautification of the countryside through those trees, road engineers knew that a driver could be lulled by the 'smoothness' of the highways into accelerating beyond their normal driving speed. Bright clumps of bougainvillea, mimosa, ginger, geranium and a hundred other shrubs produced a spontaneous reaction in most people to slow down and look. Generally, the taller exotic species such as pines and poplars could tell a driver almost subconsciously that he was approaching a bend or curve[2]. In fact, such trees were planted on the outskirts of a curve to enable drivers to determine the edges of that bend.

However, the newly constructed major highways had to be carefully maintained. One of the problems of bitumen surfaced roads was that certain sections were only suitable for pneumatic-tyred vehicles. Indeed, only one pass of a steel-tyred ox-wagon cold cause more damage to some surfaces than a thousand passes of a heavy goods vehicle with pneumatic tyres. This, therefore, necessitated the maintenance and sometimes the construction of wagon tracks parallel to the roads themselves. Although this arrangement proved costly, it was considered to be a very useful solution to rapid tear and wear of newly constructed roads. In fact, the wearing of highways continued to be a matter of concern to the Ministry of Roads and Road Traffic, especially from the mid-1950s. A good number of roads, including streets in urban areas were potholing and breaking up to the extent that complete reconstruction and maintenance from the sub grade was inevitably required.

With respect to maintenance work, the Roads Department requested for sufficient funds in 1949 to meet its numerous objectives. In its budget proposal, the following benefits were envisaged;

a) A generally higher standard of road surface;
b) A reasonably 'all-weather' road surface over a greater mileage of gravel roads;
c) Prolonged life for the many miles of strips and carpets that could not possibly be reconstructed for many years, and;
d) Better service to the colony and the road user with probable lessening in the demands for the construction of expensive surfaced roads where traffic did not warrant such expenditure if reasonable maintenance could be assured.[39]

Pursuant to these maintenance projects, the Chief Road Engineer, Durr, further proposed in his 1950-1953 road programme that the new work involved the widening of formations and culverts to full main road widths. This included the provision of two-lane bituminous surfaces where traffic density was high.[40] Where traffic density was high, such as on the approaches to major towns, the road would be provided with a two-lane bituminous surface to avoid a complete dislocation of the main road system.

Consideration was also taken to construct streets at as low a cost as possible whilst still satisfying major requirements. According to J.H. Edwards, roads and streets had many differences, both in design and construction.[41] The location of a street was usually permanent because, once a township had been proclaimed and buildings erected, the location of streets never changed. Roads, on the other hand, usually started their life following the cheapest location and it was quite usual for this to be improved and changed if funds became more available and traffic increased. In addition, traffic using a street increased to a far greater extent than traffic using a road. In terms of the surface texture of a bituminised street, it was more desirable to have a fine-grained and relatively impervious surface than a coarse open surface because a coarse surface

[38] NAZ, SRG-P (ROA), Roads and their Maintenance, 1965.

[39] NAZ, S482/123/48, Road Programme: Construction and Maintenance: 49th Cabinet Meeting: Extract from Conclusions of a Meeting Held in the Prime Minister's Room, 4 October, 1949.
[40] NAZ,S482/123/48, Road Programme: Construction and Maintenance: J.H. Durr, 1950.
[41] NAZ, S/AF651, African Roads and Road Transport, Vols. 14-16, 1956-1958, J.H. Edwards, "The Construction and Surfacing of Streets", p. 9.

with loose stone chips was untidy and uncomfortable to walk on.[42]

In laying streets, several critical steps were mandatory, the first and foremost being to divide them into various categories like main or business and secondary or residential. The objective of such a classification was to cater for different volumes of traffic.[43] For example, the weight and intensity of traffic in residential areas was not supposed to be as high as that in business or industrial areas. This classification had to receive prior consideration as it was incorrect and uneconomical to construct all streets to accommodate all classes of traffic. Therefore, certain streets were built to a lighter design than others. The next step was to consider the width of the street to be constructed in order to accommodate contemporary and future volumes of traffic earmarked to use it. The remaining servitude width of a street could be used for parking and for pavements. It was expensive to surface the entire street with a light construction and then try to increase the foundation strength at a later date as traffic increased. Adequate full-width foundations had to be built in the first instance while, incidentally, the central islands of the streets could be planted with indigenous flora to help beautify the town.[44] All in all, however, the Government of Southern Rhodesia had, by 1965, managed to implement a plan for road development which was partly aimed at opening up the Colony for tourism while improving transport networks to smaller centres.

PROBLEMS VIS-A-VIS BENEFITS OF ROAD EXPANSION THE PROBLEM OF WEARING

While the reason is not always clear for the breaking up and potholing of some post-war roads apparently built in accordance with sound practice, perhaps the chief cause of wear was lack of drainage. In case of properly shaped roads, with no clay or plastic material below the seal carpet, water could quickly be drained away. The water which might have been forced into the road through the continuous action of traffic could generally evaporate before a detrimental build-up of moisture. However, if there was clay material in or on the aggregate below the seal, the water which penetrated the surface would mix with the clay, leading to limited evaporation taking place. Moisture tended to build up on the affected roads, depending though on the intensity of traffic.[45]The presence of pockets of clay during the trimming of batters or the preparation of road shoulders makes small pieces of clay material, sufficient enough to cause wear, frequently spill on the top course. [46] Subsequent grading incorporates this material into the metal and thump-size pieces of clay may be squeezed to a thin film on the top of the metal and not boomed or washed off prior to sealing

Also roads which lay in the shade of trees, or buildings tended to pothole under moderate traffic intensities. F.H.M. Hanson (1957) stressed that trees had some direct effect on the bitumen seals of roads; hence, roads had to receive direct rays of the sun so that the sealed surface would reach temperatures in excess of 100°F wherever possible. The failure occurring along shaded sections of roads was attributable to sweeping off of stone chips from a newly laid seal coat following unavailability of hot sunshine on road surfaces. The bituminous binder could not, therefore, be softened so much that as traffic action compacted the chips, the binder was displaced to rise up around the stone fragments. Eventually, the stone chips were held down by adhesion and not by embedment.

The severest wear which occurred on a street surface was at intersections and corners due to turning of tyres.[47] At most intersections, the bitumen lost its plasticity, resulting in little adhesive remaining. Once the chips were loosened from the bituminous binder, slight breaks and cracks developed in the surface. In consequence, the resistance of the affected roads to potholing and break-up greatly diminished[3]. This situation was exacerbated all too frequently by roads with flat crowns where water lay in sheers. High road shoulders often held water on the sealed surfaces. Both factors gave rise to the fact that water was not rapidly drained from the surfaces. The knowledge of these shortfalls, however, spurred renewed efforts in the post-1965 period to avoid clay i or on any metal course which was awaiting sealing, among other measures.

THE PROBLEM OF INCREASING TRAFFIC

With increasing volumes of traffic over years, more problems were experienced. Many roads were operating at flows far in excess of design service volumes.[48] Trucks had a greater impact than cars and they consumed a greater amount of road space. In urban areas, the capacity of an arterial or a network was frequently limited by the capacity of some critical intersection delay. [49] Queue lengths or platoons increased dramatically, causing the blocking of adjacent intersections. Perhaps, the greatest dissatisfaction

[42] Ibid.
[43] NAZ,S482/123/1A/5/48, Scheme for Bulawayo Eastern Area, 1949.
[44] Variations to this recommendation could, however, be adopted, such as using light construction for parking areas. However, it should still be appreciated that such light construction had only a limited life.
[45] NAZ, GEN-NAT, National Road Safety Council of Southern Rhodesia: Papers Read at the 1961 Staff Training Seminar, 1961.
[46] NAZ, GEN-P/HOL, Extract from the 4th Regional Conference for Africa on Soil Mechanics and Foundation Engineering, December 1967.
[47] NAZ, S123/1A/3/48/3, F.H. Hinton's Letter of 21 January, 1949, Addressed to the Hon. Sir G, Huggins: The Hatfield Road.
[48] NAZ, GEN/ NAT, National Road Safety Council of Southern Rhodesia, 1961.
[49] NAZ, SRG-P/ROA, Rhodesia: Ministry of Roads and Road Traffic: Roads and their Maintenance: Economic and Administrative Sessions, 1965: Papers Read at a Road Maintenance Conference Held in Salisbury, 10-12 November, 1964.

drivers experienced was the restriction to drive at speeds convenient to them. The problem was accentuated if slow-moving vehicles were in the traffic stream. Examples of these were recreational vehicles and heavily laden trucks, both of which contributed to the formation of platoons. [50] However, ways of regulating the flow of this traffic were devised, especially with the view to minimising accidents.

The construction of off-side roundabouts with small centres and deflected approaches were widely constructed. Vehicles enjoying the right of way could proceed while the rest would give way. Traffic light signals or robots complemented the functions of robots of regulating traffic in urban areas, all of which efforts significantly reduced chances of collisions and congestion [1]. In addition, climbing lanes were introduced on grades to increase the capacity of up-grade road segments by removing the impeding effects of slow vehicles. [51] Intermittent overtaking lanes increased overtaking opportunities, and, hence, increased the level of service provided at a given traffic flow. Climbing lanes were also applied specifically to steep grades which caused heavy-freight vehicles to travel at very low speeds and this reduced the ultimate road capacity, improved the level of service, and also enhanced safety.[52]

The other means of reducing congestion or permitting dispersal of platoons was the use of paved shoulders. A roadway that was constructed with structurally adequate paved shoulders could be used to assist in the dispersal and break up of traffic queues [4]. The slower moving vehicles could temporarily use the shoulder to permit the faster vehicles to pass and then revert back to using the travel lane. In Canada, where some agencies constructed wide shoulders for a total carriageway width of eleven to thirteen metres, a high percentage of the driving population used the shoulder in this manner.[53] In Southern Rhodesia, this approach could either be considered during design or would be applied to increase capacity.

On the one hand, the introduction of the 60km/h speed limit in the Colony on roads leading into the centre of the city went a long way in reducing rates of accidents. As drivers were required to slow down, the traffic stream travelled at a more uniform speed, therefore, decreasing speed variance since the demand for passing was consequently reduced.[54] Theoretically, this meant that if all drivers were able or at least willing to drive at the same speed, there would not have been any demand at all for passing. On the other hand, every effort was made to provide more overtaking opportunities in the affected direction without neglecting benefits in safety. The passing lane concept was one of the best cost-effective measures for alleviating traffic jams and improving operations. Although traffic control devices such as speed limits were a gesture towards improving traffic flow, by 1965, most of the technology was still in its infancy and further research was required.

BENEFITS OF ROAD EXPANSION AND DEVELOPMENT

It is generally difficult to quantify the benefits derived from an improved road system. The Colony's agricultural and tourist industry, among many other facets of the economy, recorded a major boost from the ambitious road programme. However, the development of this form of infrastructure was not planned primarily to meet African needs and development. Walter Rodney argues[8], for instance, that roads in colonial Africa were built for the benefit of white settlers and their timber firms, trading companies or agricultural concession enterprises. It is, indeed, his conviction that any catering for African interests was purely coincidental. In Sothern Rhodesia, however, Africans derived a couple of benefits from the road programme within the settler oppressive system.

The saving of time was invariably one of the major benefits realised. For example, the journey from Bulawayo to the Victoria Falls could be made in about 6 hours in 1962, compared to over 10 hours before the 22-foot tarmac was laid. Inspecting this Falls Road in 1962, P.O. Dunjey, Director of the Bulawayo District Publicity Association, commended the remarkable progress that had taken place between the years 1961-1962, highlighting that this road no longer deterred any visitors from making the journey by car[2]. Similarly, other tourist roads, such as the Umtali-Inyanga and the loop from Inyanga to Rusape, were completed in 1962 and 1964 respectively. Given such improvements, the supply of transport increased to the advantage of various stakeholders.

In connection with agriculture, farmers were increasingly more flexible to sell their produce at competitive markets. Many farmers, especially African farmers, lacked the incentive to grow surplus when they knew that they could not market their produce in towns

[50] NAZ, S3285/9/48, Government Transport- Accidents and Loss of Tools,1953-1971.

[51] By definition, capacity is a function of traffic conditions and of the physical characteristics of the roadway. Research is needed to quantify how each of the various roadway characteristics affect capacity, such as lane and shoulder width, sight distance, section length, etc, plus, the effect of various traffic conditions, e.g. Smaller vehicles increase capacity.

[52] Herein, the word 'service' is taken to mean that the lane allows passing and platoon dispersal.

[53] Organisation for Economic Co-operation and Development (O.E.C.D): Road Transport Research.

[54] NAZ, S3615/6/13/1/46/1-6, Transport Accidents in Southern Rhodesia: Correspondence.

and cities due to poor transport networks.[55] The agricultural sector as a whole had generally suffered from its failure to move what it produced. Transport was critical, not as an end in itself, but because no undertaking whatsoever could do without the services which only transport could give. In fact, "transport is the lifeblood of any form of activity, and, therefore, also of economic activities, whether they take place on a remote farm or in a big mining or industrial concern" [10]. To this end, its importance to agriculture is seen in that, before implementation of the 1946 Road Programme, the problem in agriculture was not only the complete absence of transport in many areas, but also its unreliability, high cost, erratic schedules and poor management.

The obstacles to mobility not only restricted the market, but increased the cost of production as well. The prices of basic foodstuffs and other items had risen beyond the reach of many rural people with limited purchasing ability. With improvements on transport, fresh vegetables and other perishables now reached the consumer quicker than they did before. They could now be moved in refrigerated vans. Interestingly, African produce also found its way onto the market in direct response to post-war needs and better roads and increased traffic. Beans and other foods used to remain on the farms awaiting transportation to market centres, eventually turning into fertiliser because of lack of adequate transport services.[56] The same can also be said about commercial fertiliser supplies which did not sometimes arrive in certain regions until after the growing season was half over.

As in agriculture, a fair number of benefits were derived from road development in relation to industry which emerged stronger because of wartime needs. The manufacturing sector received a boost from the expanded market which was created by the Federation of Rhodesia and Nyasaland in 1953, the very same year in which the Roads Department was elevated to Ministry status. The relatively efficient road network made it possible for Salisbury to become an economic hub of the federal states. The forward and backward linkages between agriculture and industry thrived on the sound road infrastructure, especially given that door-to-door deliveries of either raw materials or finished goods were made. Minerals like chrome, iron, copper, tin and later on nickel were transported to proposed destinations; hence, improving the manufacturing sector.

Jobs were also created during this period for both whites and blacks alike. Places were reserved for whites as material engineers or professional and technical officers in the Roads Department Laboratory.[57] For Africans, the majority of the jobs available were menial and low paying. In some circumstances, there was use of coercion in African labour mobilisation and compulsory road repair in a system called "Kumadhiga".[58] Some got opportunities to work as drivers since many transport companies were expanding their operations. According to Genie Kusena, one the retired long-distance truck drivers at BP & Shell Marketing Services, the number of aspirants to take up driving as a profession increased and his company frequently held in-service training sessions for them.[59] Many other people worked in motor courts and motels which sprouted along highways such as those at Bubi or Lundi between Fort Victoria and Beitbridge. Motorists, therefore, supported the nationwide networks of roadside cafes, eating and sleeping along the highways.

CONCLUSION

The primary objective of this paper has been to fill the gap in literature by providing critical information about the development of roads and road traffic in Southern Rhodesia from 1945 to 1965. Emphasis has been placed on the arguments leading to the formulation and implementation of a road programme to implement existing ones. The findings of the Roads and Rail Transport Commission of 1940 have been analysed in terms of how they influenced subsequent road policies. The same has been done for the role played by the phenomenon of Road Councils in the whole scheme of operation, and the outcomes have been highlighted. The ten-year programme (1946-1956) which was aimed at giving major priority to major highways, for instance, produced 'all-weather' highways and bridges which enabled a smooth flow of traffic in the Colony. The problems of inadequate funding have been explained as well.

Benefits accruing from the road construction and maintenance programme have been noted. These included the reduced travelling time, the quick transfer of goods, people and information, the mushrooming of small-scale industries as well as increased employment opportunities and agricultural productivity. However, the programme had its own demerits, especially with

[55] Interview with Professor George Kahari on 13 October, 2005 at the University of Zimbabwe. Professor Kahari was born on 20 July, 1930 at Masambura, Chiriseri, where communal farmers used the new roads to haul their produce to Salisbury in the 1960s and on.

[56] Interview with Pheobe Mavu, a communal farmer at Masvaure Communal Area in Bocha, Marange on 1 October, 2005 at Bambazonke Business Centre, Mutare. Born on 8 August, 1937.

[57] NAZ, S1049/1, Roads in Victoria Native Reserves.

[58] This term implied the digging up and levelling of soil to fill up patches using hoes and shovels. As the road construction programme spread to most centres of the country, such laborious labour needs assumed new quantitative proportions. Wages accrued were so meagre that they were only sufficient to cater for "chibharo" (compulsory taxes for every household) and a few purchases.

[59] Interview with Genie Kusena on 26 September 2005 at Kambuzuma, Harare. Kusena started his driving career in 1956, beginning as an employee at Schweppes Orange Ltd, then Rhodesia United Omnibus Company before finally joining BP & Shell (Cougar Ltd) until his retirement in 1997.

regards to non-settler areas where no effort was made to give the majority of the roads a bituminised surface. With reference to transport, the situation in rural areas remained critical and many Africans resorted to walking while carrying loads on their heads, shoulders or backs. In addition, the many able-bodied Africans who were conscripted to provide labour were grossly underpaid. Few households owned animal drawn cuts while others had bicycles to meet their transport needs.

REFERENCES

1. Collins MO; The Rhodesian Book of the Roads, (Edited by S, Pratt), Salisbury: M.O. Collins, 1976.
2. De-Soissons M; Rhodesia's New All-weather Roads: The High-Level Bridges. Africa CallsFrom Rhodesia to Nyasaland, No. 15, September-October, 1962.
3. Hinton FHM; Why Do Our Roads Fail?. Extracts from a Paper Presented to the New Zealand Institute of Engineers, Road Structure, February, 1957.
4. Millard RS; Research on Overseas Road Problems, Corona1958; 10(11).
5. Mitchell RL; Rhodesian Road Development.The African Market, September, 1947.
6. Mlambo AS; From Dirty Tracks to Modern Highways: Towards a History of Roads Transportation in Colonial Zimbabwe, 1890 to World War Two, Zambezia. Zambezia,1994; 21(2):147-166.
7. Mushunje S; The Development of Road and Road Transport in Southern Rhodesia, 1890-1940', BA (Hons) Dissertation: University of Zimbabwe, 1986.
8. Rodney W; How Europe Underdeveloped Africa, Washington: Howard University, 1982.
9. Salmon TC; A short history ofRhodesian Roads: Part 1. From Veld Track to Strip Road. Rhodesian Engineer, 1969;7(5):849-851.
10. Verbugh C; Road Transport of Goods in South Africa, Stellenbosch: University of Stellenbosch, 1958.