

HOFMEYER- ROADS 1915-1937

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THE HISTORY OF ROADS IN THE SOUTH AFRICAN ERA

4.1 PHASE ONE FROM 1915 TO 1937

The ultimate colonial transport objectives have remained the same under the South African control from 1915 up to 1990 on the Independence of the Republic of Namibia, despite the provisions of the League of Nations Mandate and the subsequent requirements of the United Nations Trusteeship Committee and the Council for Namibia. The only change in the German pattern proved to be even more disadvantageous for Namibia, because the transport orientation shifted from a more east-west to a South African orientated north-south direction.

After the First World War the League of Nations entrusted the Mandate over Namibia to the Union of South Africa on 17 December 1920. The German Roads Ordinance of 1912 was duly replaced by a South African one in 1923. This "Roads and Outspans Proclamation No. 30 of 1923" was signed by "His Honour Gijbert Reitz Hofmeyr, a companion of the most distinguished order of Saint Michael and Saint George, Administrator of South West Africa" on 15 October 1923. This Ordinance assigned the following meanings to the different road classes:

"" public road' shall mean:

- (a) any road designated and established as such under the Ordinance of the Imperial Governor of German South West Africa dated 14 June 1912;
- (b) any main, district or farm road proclaimed under the powers conferred by this Proclamation: Provided that nothing in this Proclamation contained shall apply to any road within the area of a Municipality or Village Management Board."

The Road from Windhoek to Kapp's Farm, 1922

This Ordinance also dealt with the question of compensating private landowners for the usage of road construction and maintenance materials which could be removed from private ground without payment as long as these materials were used for the construction and maintenance of proclaimed roads. This was a new principle because in the German Roads Ordinance from 1912 no such provision had been made. This principle has been retained in all Namibian Road Ordinances until the present day. In the reports to the League of Nations [78] no mention is made of roads until the year 1925, when an amount of R 766,44 was provided for under the Public Works Vote [79].

A new Roads Ordinance 15/1927 made provision for the establishment of Roads Boards in each Magisterial District of Namibia. Members of the Board were elected by registered owners of landed property in the district, that is to say, only white persons had any voting rights. Each Board was entrusted with the construction and maintenance of public roads within its Magisterial District, except in areas under the control of urban local authorities, which were vested with similar powers in their respective areas. The Boards had the power to impose a road tax on all landed property in their areas. This tax was based upon the extend of the land.

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The tax was levied at the discretion of the Board and usually ranged from R 0,05 to R 0,10 per hectare. This rate was not sufficient to pay for all the road construction and maintenance requirements, and the Legislative Assembly of the - all white - Administration for South West Africa, therefore imposed a wheel tax of R 0,75 per wheel per annum upon all vehicles in Namibia. This revenue must in accordance with the law be applied to roads in the district in which the tax was collected. The areas outside the so-called white districts of Namibia were thus not included in this roads tax system.

In addition to this, the Administration granted a subsidy not exceeding R 3,00 for every R 1,00 spent by the Roads Boards on main roads. The Administration's subsidy during the financial year 1926/27 amounted to just over R 24.000. In the report of the mandatory power to the League of Nations for the year 1927 it was further stated that: "The Boards have done splendid work and, as a result of the improvement of the roads, motor transport is everywhere replacing animal transport and the opening up and the development of the country is being enormously expedited." Above report continued to state that "nobody should expect that South West Africa's roads system would be the best in the world because the character of the country would be against the construction of first class roads. Responsible for this would be an abundance of mica schist and sand and the scarcity of good road building materials. In Owamboland, for instance, not a single stone could be encountered, except in the vicinity of the Kunene River. The building of a modern highway from the north to the south of the territory would cost hundred thousands of pound sterling, which the administration never could afford to spend".

It is therefore apparent that the Roads Boards, under the chairmanship of the local magistrate, were responsible for the collection of taxes and the repair and maintenance of roads within their respective districts from revenue collected by them. In 1930, an amount of approx. R 25 was made available to each magistrate to enable the worst causeways over rivers and streams to be repaired. In cases of serious wash-aways on major roads additional funds were granted to the Roads Boards to effect urgent repairs of river drifts damaged by excessive floods.

Apparently, arrangements also existed between the chairmen of the Roads Boards and certain "white" farmers whereby the roads across their farms were kept in order by granting nominal remuneration by the Board. The first Road Motor Transport Service of the South African Railways and Harbours was also established during this period and was instituted between Mariental and Stampriet and Mariental and Aranos on 1 February 1927. The heavy transport vehicles used put an extra stress on the maintenance of public roads. They also contributed to the further expansion of the Namibian roads system, giving an indication of where new roads were required relative to the economic growth, but solely in the interest of the white population group. The next "R.M.T." services were instituted between Mariental and Maltahöhe on 1 April 1928, Mariental and Lidfontein on 13 December 1928, followed by the Windhoek to Dordabis service on the 1 May 1930, and Omitara to Otjinene as well as Omitara to Okozondana services on 8 December 1930 [80].

The first tractor drawn grader was purchased during the financial year

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1932/33 by the Works Branch of the Administration for the maintenance of Namibian roads. In 1932 two maintenance units were brought into being with the help of two second-hand lorries, a 5 ton "Federal" and a 2 ton "Reo" in the Windhoek district. The first light motor grader, a Galion, was purchased in 1936. Relief work for needy persons during the drought and depression of 1930/33 was provided by the South West Administration, and during 1932 to 1933 some 250 to 300 "white" relief workers were employed on roads [81].

At this stage the maintenance and repair of roads were the responsibility of the Works Branch of the South West Africa Administration. The exact distances of main and district roads in existence at this stage are not recorded. The above position prevailed in Namibia up to about 1937, and this marks the end of the first phase [82].

4.2 PHASE TWO FROM 1937 TO 1945

Not much of a development has taken place in Namibia in the years 1930 to 1934 due to the world economic depression and a severe drought which was, however, broken by an extraordinary good rainy season - the best so far recorded in the history of Namibia - in 1934. It was not until 1937 that it was reported [83]:

"An important change in roads policy was effected during the year. The Roads and Outspans Ordinance, No. 7 of 1937, abolished all Roads Boards, created a Roads Fund, and placed the construction and maintenance of all public roads upon the Administration. The Department of Works is now responsible for the construction of all public roads in the Territory. Major equipment to the value of R 82.000,00 was purchased during the year, and with the aid of this machinery considerable improvement was effected in the condition of roads. The equipment handed over by the Roads Boards was practically nil. An organisation was started on bridge construction and it is hoped that funds in the future will permit a steady progress in the construction of low level bridges and other drainage crossings. A low level bridge was completed over the Omatako Omuramba on the main road to the north." [84]

Road to Goanikontes, 1946

Section 6(e), Chapter II of Ordinance No. 7 of 1937, provided that the Administrator of South West Africa shall institute a Central Roads Board, whose functions powers and duties were laid down by Government Notice No. 8 of 1938, and whose duties should be [85]:

"It shall be the function and duty of the Board to advise the Administrator on all such matters relating to the carrying out of the provisions of the Ordinance and the furtherance of the objects thereof, as may be referred to it by the Chairman thereof, and on all such matters as may be specially referred to it by the Administrator."

Until the year 1937 no specific vote existed for road building and it was not until Ordinance 7 of 1937 was passed that specific amounts were voted for specific works. The amounts accruing to and expended from the Roads Fund from 1937/38 to 1945/46 showed a steady increase from approx. R

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125.000 to approx. R 250.000. Discrepancies between accrued and expended amounts have been made up from the Territorial Development and Reserve Fund. In fact, more has been spent on roads than the amount of taxes that has been especially levied for road construction and maintenance.

Nevertheless, the expenditure during the 1937/45 phase remained fairly constant, showing a small increase in 1945 and indicating a more or less dormant period with very little expansion and mainly concentrating on the maintenance of roads. It was not until 1945, after the end of the Second World War, that a more extensive program could be carried out.

In 1937 road building activities were the responsibility of the Works Branch of the Administration using its own personnel. In 1937 only a "Field Assistant-in-charge" existed, a post which was changed to a Superintendent of Roads in September 1945. During 1938 the Roads Section of the Works Branch moved to new premises on the same location where the present Department of Transport of the Ministry of Works, Transport and Communication of the Republic of Namibia has been established. The workshops of the Irrigation Section of the Works Branch were taken over for the repairs of vehicles and road building machinery, and the necessary mechanics were appointed during this year [86].

Apart from the above mentioned Superintendent of Roads and his staff of four permanent officials in Windhoek, all the field personnel, i.e. plant operators and labourers, were employed on a temporary basis. During 1945 the posts of Inspector of Roads and three Assistant-Inspectors were also created while the first Civil Engineer, an Assistant-Engineer, undertook the design of bridges and the drawing up of plans. All these posts were filled by transfers from or in response to press advertisements in South Africa.

Until 1945 very few bridges and other structures were built. It proved expedient to concentrate on the provision of concrete slabs and low-level bridges over rivers that were the longest flowing during the rainy seasons, and in most cases low-level bridges sufficed. The structures built up to 1945 were [87]:

High Level Bridges	- 2
Low Level Bridges	- 9
Road over Rail Bridges	- 2
Concrete Slabs	- 10

Numerous culverts were, however, also constructed during this period between 1937 and 1945.

In 1937/38 the first two Caterpillar II motor graders were purchased as well as a motor driven 3 wheel roller. An additional Caterpillar II grader was purchased in 1939. By 1940, four heavy motor graders, one crawler tractor, one 5/8 cub.yds. truck mounted loader, several tractors towing 3 ton drawn graders and a number of trucks were in operation.

By the end of 1945, the following machines were on hand and this reflects the start of rapidly expanding road constructing and maintenance activities since 1945 [88]:

Light trucks	- 12
Flat trucks	- 26
Tip trucks	- 33
130 gallons water trailers	- 33

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600 gallons water trailers	- 4
Trailers	- 19
Drawn graders	- 14
Motor graders	- 6
Wheel tractors	- 19
Crawler tractors	- 1
Sheep foot rollers	- 3
Centrifugal pumps	- 4
Concrete mixers	- 3
5/8 cub.yds. truck mounted loader	- 1
Diesel rollers	- 3
4 cub.yds. scrapers	- 1

The "Report of the Roads Construction Commission 1950", paragraph 143, reads as follows [89]:

"Only after the Second World War have serious attempts been made to organise a Roads Department so that roads can be planned, improved and built more efficiently, and that a more regular system of maintenance can be introduced."

The war period was not a very active period in the development of Namibia's roads system. In this phase the following Road Transport Services of the South African Railways and Harbours have been instituted:

Konkiep - Helmeringhausen 12.09.1938
Keetmanshoop - Koës 12.10.1938
Keetmanshoop - Aroab 21.10.1938
Grootfontein - Odibo (Owamboland) 29.09.1941

On 1 May 1939 a service, available on request only, was instituted from Tsumeb to Oshikango on the Angolan border. This was the first service to Owamboland and by 1941 this became a regular service (Grootfontein-Odibo). The introduction of this permanent bus service required the relocation and improvement of the road between Tsumeb and Ondangwa via Namutoni in Etosha over a distance of 180 miles. These works were undertaken during 1940.

In 1945 the Roads organisation of the Administration's Works Branch consisted of the following construction and maintenance units:

2 Bridge Construction Units
4 Road Construction Units
13 Grader Maintenance Units
16 General Maintenance Units
1 Grid Gate Unit

4.3 PHASE THREE FROM 1945 TO 1952

After the Second World War the South African " Public Service Commission" for the first time made available professional and technical personnel to the Works Branch of the Administration for South West Africa. This enabled detailed surveys, location and design of bridges, and marked the beginning of programmed road building activities in Namibia.

This time also heralds the beginning of a boom period with expansion in the karakul, mining and building as well as fishing industries. At this time blocks of state-owned " Crown Land" were being cut up into farms and were being allocated to mainly white ex-soldiers of the South African

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Army. These newly developed areas were situated mainly in the Khomas Hochland and in the Omatako as well as in the Namib regions. The Khomas Hochland, being a particularly rugged and mountainous area, was formerly served only by the most primitive rocky tracks. From 1946 one of the six road construction units was allocated to provide a road through the Khomas Hochland which also linked Windhoek directly with Swakopmund on the Atlantic coast. This construction of main road 52 involved heavy mountain-pass work [90].

Farms were also allocated in the district of Gobabis which falls within the Kalahari region with heavy, deep sand where road construction provides its own peculiar problems. Another geologically harsh area was the north-western region of Namibia, the " Kaross Block", which was also divided up into farms which in due course extended southwards to the Ugab River. In these days the small district town of Welwitschia, subsequently renamed to the former Khorixas, district capital of Damaraland, was established. By the end of the 1940s these areas had been sufficiently well served by roads and a network of South African Railway Road Motor Transport Services.

It is of interest to quote from the Report for 1946 of the Government of the Union of South Africa to the Council of the League of Nations concerning the roads administration of Namibia [91]:

"Some years ago the Administration decided to establish road depots at Keetmanshoop, Mariental, Otjiwarongo and Grootfontein in addition to the main or central depot and workshops at Windhoek. When these are all completed, equipped and brought into operation, the work will be much facilitated, since it will be possible to undertake maintenance and repair jobs as well as overhauls at those centres without dispatching the road machines to Windhoek for this purpose."

In May 1946 the first two roads engineers were appointed in the Roads Section of the Works Branch of the Administration (Günther Weder (civil) and Markus Loteryman (mechanical)). In all, the technical staff of the Roads Section consisted of three engineers, all stationed in Windhoek, while the districts were controlled by two road inspectors and three assistant road inspectors of the Works Branch of the Administration who were stationed at Grootfontein, Otjiwarongo, Windhoek, Mariental and Keetmanshoop. The field staff consisted of:

3 Bridge Construction Units

6 Road Construction Units

1 Grid Gate Unit

25 Grader Units and a few light maintenance units.

These units consisted of "147 white and 796 non-white" employees. During the financial year 1946/47 an amount of R 150.000 was appropriated from the Territorial Development and Reserve Fund to the Roads Fund and the estimated expenditure under the latter was R 320.000. In addition to road construction and maintenance 340 miles of the Botswana border were cleared during 1947 to facilitate patrols, to control the spread of foot and mouth disease and combat grass and bush fires. No expenditure figures in this regard are on record, however. The most important road construction job in 1946 was the building of the first section of a main road into the Khomas Hochland, and a length of 68 miles had been completed. In the same year,

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grader units maintained 11.961 miles of graded roads.

In spite of an amount of R 615.000 spent out of the Roads Fund in 1950, there were still so many shortcomings in the roads system of Namibia that the Executive Committee appointed a commission to look into this matter. The report of the " Roads Construction Commission 1950" recommended inter alia [92]:

"Your Commission considers it essential that the Roads Department should be distinct from the Works Department, and that this separately established department should have its own qualified departmental head . . . The Commission has studied the existing legislation thoroughly, and has examined witnesses on the subject. It concludes that the legislation itself is, with a few exceptions, satisfactory . . . The law about outspans, which says that outspans should be one hundredth of the farm, is antiquated, and has fallen into desuetude. Trek animals stop in their tracks to rest where the setting sun finds them . . ."

In subsequent legislation, outspans were done away with and the road reserve width was fixed at 60 metres. The Commission also went into the question of bridge construction and drainage of roads, as can be seen from the following remarks:

"Provision should, therefore, be made for abnormal conditions only after careful consideration. This policy is justified as it seems to be impossible, with the funds available, to make adequate provision for effective drainage along an entire route, for both ordinary and extraordinary conditions."

On the subject on surfaced roads the Commission recommended as follows:

"Although tarred roads are more expensive than gravelled roads, the Commission feels that tarred roads would be a boon to the country, and would advance the attempts of real road-building already being made. Elsewhere we mention that a sound start has been made with 500 miles of road, and we now recommend strongly that these 500 miles should be tarred immediately."

Construction of Khan River Bridge at Usakos, 1952

It was not possible, however, to make a start with this work until 1956.

The Commission also recommended the establishment of a soils laboratory for the testing of soils, gravel and stone types for the purpose of road construction. On gravel roads they recommended one motor grader for every hundred miles on main roads. The Commission's Report was accepted with certain amendments by the Executive Committee of the Legislative Assembly of South West Africa by Minute No. 619 of 20 December 1950. The design and construction of bridges during the period 1946-1951 were on the increase and the following structures were erected during this period:

High Level Bridges 10

Low Level Bridges 4

Concrete Slabs 12

In 1946 the total mileage of all proclaimed roads was 21.000 miles. These proclaimed roads have been classified into main roads, main district roads and farm roads. The first two classes were maintained directly by the Roads Organisation while grants were given to the magistrates of each

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district for the maintenance of farm roads. In 1949 the mileages with a total of 21.189 miles of proclaimed roads were as follows:

Main Roads 3.229 (5.195 km)
Main District Roads 3.879 (6.241 km)
District Roads 14.081 (22.656 km)

At the end of 1952 approximately 60 major structures, mainly bridges over the larger rivers of the country, existed and are listed in Appendix Table 4 at the end of this study [93].

Such was the state of the roads organisation before a separate Roads Department was established on 1 June 1951. On 9 January 1952 the first "Chief Roads Engineer" (M. Loopuyt) assumed his duty at the newly created Roads Department and began a new chapter in the history of roads in Namibia.

The establishment of the Roads Department as a separate branch of the SWA Administration marked an important turning point in the development of Namibia and formed the framework for what was to become the former Administration's and later Central Authority's of Namibia biggest single division, in terms of the overall budget. As its prime task, it had to plan, construct and maintain a roads system which in 1952 barely was existent, to serve a country of 824.269 km² with a total population of only approx. 450.000 in 1953 (Current estimated population (1995): 1.520.000, last census in 1991 resulted in 1.455.396 and included Walvis Bay).

To add to the difficulties, large areas of Namibia are desert or semi-desert with their own peculiar ground formations and many other natural obstacles which are unique only to this country and which have a marked influence on the planning and building of roads. To top it all, the Department of Transport was, and still is, faced with an acute shortage of highly skilled labour, technical and professional staff.

That Namibia's unique " salt gravel roads" came into being in the late forties happened almost by chance. Heavy trucks bringing salt blocks from the salt mines north of Swakopmund to Namibia's harbour town, Walvis Bay, used the poor tracks along the Atlantic coast. The sandy desert sections could be crossed only with great difficulties, and it was duly decided to repair the tracks with the freely available salt/clay material under supervision of the Roads Branch of the SWA Administration. No materials specification for this unique gravel mixture existed at the time, but the unsaturated rejected low-salt content material from the salt mines and salt pans north of Swakopmund was placed on the road by trial and error, distributed and levelled by hand and then traffic-compacted by the same trucks which caused the damage. In many cases, during their empty return trips, these trucks were used to haul some of the salt-concentrate. The new innovative road building and maintenance method resulted in a road type which was dust-free and looked nearly as a black-top road, long time before the first bitumen-paved roads came into being in Namibia. The first salt gravel roads were authenticated by Siegfried Engels, one of the oldest still living Namibian " Padmakers" (road builders). Engels was one of the last eyewitnesses of a memorable era of road building in Namibia when, for instance, it was normal practice to improve the dangerous crossing of the Omaruru River north of Hentiesbay by paving the riverbed

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with "sealskins" to get the traffic across.

During the 1950s the newly created " Salt Maintenance Unit SMU 1" began serious construction of a high standard salt-road from Walvis Bay in a northerly direction. In the early 1960s the "SMU 1" reached a point just north of Cape Cross at 140 km (Mile 87) north of Swakopmund.

Simultaneously, the "salt-road-technique" was also used to build the first section of the trunk road 2/2 from Swakopmund in an inland direction towards Usakos, which proved to be a successful experiment as long as the salt-gravel method was applied in the moist mist-belt region of the Atlantic coast. At the end of the 1960s a point 209 km north of Swakopmund (Mile 130) at the Ugab river mouth was reached.

4.4 PHASE FOUR FROM 1952 TO 1965

On the 13 June 1953 a new "Roads Ordinance and Road Traffic Signs Ordinance" was promulgated. This Ordinance made provision for four classes of roads: trunk, main, district and public roads. Trunk roads are arterial roads forming part of the roads system connecting Namibia as a whole with neighbouring countries. Main roads are important roads connecting important centres within Namibia. District roads are feeder roads carrying a reasonable amount of traffic which largely serve the - mainly white - farming area and provide access to the arterial and main roads system of the country. Public roads are proclaimed roads but their construction and maintenance are not generally undertaken at the expense of the government. The Central Roads Board was duly abolished and the new ordinance introduced a system of separate Roads Boards in each magisterial district consisting of the magistrate as chairman and four other members from the particular district and who were appointed by the South African Administrator. These Roads Boards "shall assist and advise the Administrator on all matters relating to public roads within its district, obtain and transmit all information he may require in connection with the Administration of this Ordinance or the regulations thereunder and generally carry out all such functions as the Administrator may from time to time assign to it". [94]

Under the provision of Ordinance 17 of 1953 1.877 miles of trunk roads, 4.571 miles of main roads, 8.958 miles of district roads as well as 15.270 miles of public roads (now farm roads) were proclaimed between 1953 and 1955.

Road Signs, approximately 1960

In April and May 1956 the Public Service Commission of the Union of South Africa carried out a further inspection resulting in a new permanent personnel establishment of the Roads Department: The personnel of the Department was increased from the former total of 58 to the following 137 posts:

Engineers	12
Road Inspectors	12
Technicians	31
Administrative and Clerical	82

During 1956/57 a large, modern mechanical workshop was established while

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the laboratory was considerably expanded. At the same time the South African " Native Affairs Department" asked for assistance to build the road from Operet to Ondangwa while the construction of a road to Rundu in Okavango was also under consideration [95].

The regional engineer's structure consisting of three regions Keetmanshoop, Windhoek and Otjiwarongo was still retained but the former eight road inspectorates were increased to twelve. The revenue accruing to the Roads Fund increased between 1952 and 1956 from R 194.422 to R 529.214, while expenditure in the same period increased nearly threefold from R 877.260 to R 2.131.928. At the same time the number of vehicles in Namibia increased from 13.870 to 20.512 vehicles.

At the end of 1956 the following units were in operation [96]:

Construction Units	8
Bridge Construction Units	4
Grader Maintenance Units	90
Ordinary Maintenance Units	41
Sandspoor Units	4
Gravelling Units	8
Pipe Units	8
Grid Gate Units	8
Firepath Units	2

At the end of 1956 the following proclaimed road mileages with a total of 34.354 miles existed:

Trunk Roads	1.902 (3.060 km)
Main Roads	5.084 (8.180 km)
District Roads	9.833 (15.821 km)
Farm Roads	17.535 (28.213 km)

Still not satisfied with the progress in the provision and maintenance of Namibian roads, the Administrator-in-Executive Committee resolved on 19 June 1956 that a commission be appointed to investigate and report on the above matters. The " Cloete Commission" recommended the purchase of standardised road building machines and vehicles which had proved themselves under working conditions in Namibia and South Africa and for which spare parts and accessories were readily available, and that these plant as far as possible were to be kept in the districts to which they had been allocated. It was further recommended that the construction of the new mechanical workshops at Windhoek, for which R 152.000 had already been allocated, be expedited. In regard to staff, the commission recommended a system of training by which all - white only - operators would receive a more thorough training in road building operations. It also recommended that new specialised road construction units be established, and that a start be made with the provision of surfaced roads. These to be built surfaced black top roads had to be given out under private contract, the funds for which had to be raised by means of loans [97].

During the period 1952 to 1955 the following work was done for the South African Department of Bantu Affairs:

Aerodrome Rundu	R 82,00
Grootfontein - Rundu Road	R 4.000,00
Namutoni - Ondangwa Road	R 117.000,00

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Herero Area of Aminuis R 65,00
Aerodrome Okakarara R 1.088,00

The construction of the first modern gravel road into Owamboland to Ondangwa enabled the start of a more reliable transport link between the "white sector" and this till then neglected part of Namibia. According to an Executive Committee Resolution, dated 13 May 1958, the road from Oshivelo at the southern border of Owamboland to Ondangwa was to be maintained on a 50/50 basis by the Roads Department and the South African " Department of Bantu Affairs". On 22 September 1959 the Executive Committee agreed in resolution No. 952 that a to be created Owambo Unit was to build and maintain this road. The road was proclaimed as trunk road 1/11 from Oshivelo to Oshikango at the Angolan border. In the same year a start was made to build a new direct road from Grootfontein to Rundu in the Okavango traversing virgin forest landscape and deep sand. On 1 October 1964 this road was proclaimed as trunk road 8/2 resp. 8/3.

By Executive Committee Resolution No. 1003 of 7 September 1961 it was decided to proclaim and build the following roads as district roads to generally improve the road infrastructure in Owamboland [98]:

Ondangwa - Okatana dam (later Oshakati) - Oshikuku - Ombalantu

Ombalantu - Kalongo - Ongenga - Oshikango.

Oshikuku - Elim - Ongandjera - Okualuthi - Onkolonkathi.

Ongandjera - Ombalantu.

Ombalantu - Okualuthi - Kotjekua - Opuuo (Kaokoland).

Oshikango - Eenhana - Epasha.

Most of the above 440 miles were, however, not proclaimed before 1978 and they were not built before independence.

Towards the end of 1953 the testing of materials for gravel roads, and two years later, for surfaced roads started at the Central Laboratory. During this period between 1952 and 1956 the following major drainage structures were built:

High Level Bridges 16

Low Level Bridges 2

Concrete Slabs 11

For the first time use has been made of a newly developed simple, standardised bridge type with a 28 feet span.

By Executive Committee Minute No. 256 of 22 February 1956 it was approved that two construction units be equipped, including the conversion of the existing first unit, to start the construction of the first surfaced roads in Namibia. The building of a double lane surfaced road from Windhoek firstly to Brakwater, secondly to Aris and thirdly to Kapp's Farm was to be set as a target. Additionally it was resolved by Executive Committee Minute No. 1156 of 17 October 1957 that one, already built trunk road in the north, i.e. the Otavi - Tsumeb road (trunk road 1/9) and another, an entirely new one in the south, from Keetmanshoop in a northern direction for approximately thirty miles (trunk road 1/3), be given out under contract for surfacing. For the first time the use was made of the services of private consulting engineers for the planning, design and supervision of the execution of the above mentioned contract works. Two South African consulting engineer firms were duly entrusted with the above mentioned services for the Otavi - Tsumeb, the Keetmanshoop - Wasser and

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the Windhoek - Aris trunk roads.

A proposed long term policy to surface 2.000 miles of trunk roads was accepted in principle by the Executive Committee by Resolution No. 670 on 16 July 1958. It was suggested to provide the whole Namibian trunk road system with a 20 feet wide bitumen surface, and the cost in those days for 2.000 miles were estimated at R 60 million.

By the end of the 1959/60 financial year there were a total of 60,7 miles of completed surfaced roads, made up as follows [99]:

Trunk Road 1/4 Mariental - Rehoboth 4,5 miles (7,2 km)

Trunk Road 1/5 Rehoboth - Windhoek 11,4 miles (18,3 km)

Trunk Road 1/6 Windhoek - Okahandja 28,1 miles (45,2 km)

Trunk Road 1/9 Otavi - Tsumeb 15,7 miles (25,3 km)

Trunk Road 6/1 Windhoek - Kapp's Farm 1,0 mile (1,6 km)

During the financial year 1960/61 56,5 miles of bitumen surfaces were laid so that by 31 March 1961 117,2 miles of surfaced roads were in existence in Namibia. Until the 31 March 1965 this figure had risen to a total of 477,6 miles of surfaced roads.

The acceptance of many of the recommendations regarding road construction set out in the Report of the Odendaal Commission resulted in a considerable speeding up of the tempo of surfaced roads construction, again mainly dictated by white interests [100]. Also the tempo of the regravelling of existing gravel roads increased considerably. From the financial year 1957/58 to 1964/65 the mileages of gravel road construction increased from 188 miles to 682 miles.

During 1965 the following road construction contracts were in preparation by private Consulting Engineers to be let at the end of 1965:

Trunk Roads 2/1, 2/2 and Main Road 36: Trekkopje - Swakopmund - Walvis Bay - Rooikop

2 contracts)

Trunk Roads 1/1 and 1/2: Keetmanshoop - Narubis - Grünau (2 contracts)

Trunk Road 1/10 and Main Road 98: Tsumeb - Geluk - Operet - Namutoni (2 contracts)

Trunk Road 1/10 and Main Road 92: Okatana (Oshakati) - Ondangwa - Operet (2 contracts)

The construction of the Swakop River Bridge at Swakopmund, one of the largest pre-stressed concrete bridges in the southern hemisphere was, however, only completed in June 1969.

Due to the continued expansion of the Roads Department at this time, new accommodation had to be built all over Namibia. A start was made with the erection of a new roads depot at Karasburg during 1951/52, followed by Usakos in 1956/57. In 1957/58 a start was also made on a new office complex for the head office and the central workshop and stores in Windhoek. In 1959/60 depots were erected at the following places:

Bethany, Maltahöhe, Outjo and Okahandja, followed by Grootfontein, Tsumeb, Otjiwarongo, Mariental and Gobabis in 1964/65.

Following a new inspection by the " Public Service Commission" of South Africa in 1959 and the Organisation and Methods Section of the Administration for South West Africa during 1963 it was decided to expand the organisation of the Roads Department further. This expansion resulted in a new personnel establishment of 258 civil servants, including 44

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engineers, at the head office in Windhoek. The increase in personnel resulted also in the necessity of constructing further new office buildings in Windhoek and new Regional Engineer's offices at Keetmanshoop, Otjiwarongo and Grootfontein.

During 1962 a new Roads Ordinance No. 28 dated 5 July 1962 was created. This Ordinance 28 of 1962 was developed for the amendment and consolidation of all existing territorial laws and ordinances as well as amendments on roads and for the arrangement of related matters. At the end of the financial year 1964/65 the total mileage of proclaimed roads was 37.112 miles of which 20.651 miles were trunk, main and district roads to be regularly maintained by the Roads Department. In the same year the Road Motor Transport Service of the South African Railways and Harbours had also increased to 5.484 route miles. The following bridges were constructed between 1957 and 1965:

High Level Bridges	98	bringing them to a total of	126
Low Level Bridges	8	#	23
Road over Rail Bridges	7	#	9
Concrete Slabs	6	#	39

The period from 1957 to 1965 showed a distinct increase in the number of high-level bridges built due to the roads paving program which started during this year. The twenty year period from 1945/46 to 1964/65 also showed an increase in the expenditure of maintenance machinery with an expenditure of R 36.876 in the former and R 961.064 in the latter with a peak expenditure during 1959/60 of R 1.241.392. The rate of vehicle growth in Namibia between 1953 and 1964 continued to rise with an average increase of 10% annually to 35.700 vehicles at the end of 1964. Finally the following number of road construction and maintenance units for the year 1965 are shown:

Maintenance Grader Units	112
Light Maintenance Units	17
Sandspoor Units	8
Re-Gravelling Units	12
Pipe Units	13
Gravel Construction Units	8
Bitumen Construction Units	2
Bridge Construction Units	8
Roving Betterment Units	24
Bitumen Repeal Unit	1
Salt Road Maintenance Unit	1
Grid Gate Units	12
Bitumen Maintenance Units	12

Except for the grader maintenance and bitumen maintenance units which increased considerably over the next twenty years this number of units stayed more or less constant between 1965 and 1986. All units mentioned above were mainly used in the "white" areas in 1965. A comparison between these units and the number of units used in Owamboland in 1965 is especially interesting:

Maintenance Grader Units	5
Light Maintenance Unit	1
Re-Gravelling Unit	1

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Maintenance Graveling Units 2

Roving Betterment Unit 1

In the following years this relationship did not change much in favour of neglected areas. The roads system at the time (1965) was still not geared to territorial integration between all regions of Namibia and to neighbouring countries in the east and north. But the basis for a modern roads infrastructure in Namibia was laid in 1965, and the modern age in the development of a roads system - at least for the requirements of the "white" population group, whose interests were still synonymous with those of the ruling power - had arrived.

4.5 PHASE FIVE FROM 1965 TO 1987

The period from 1965 to date can be characterised by the consolidation and uplifting of Namibia's roads network to one of the finest in Africa. However, one of its striking features is the different status in quantity and quality of its roads system between the so-called modern areas in the southern and central parts and the densely populated and more traditional parts in the north. This phase was highlighted by the surfacing of a large portion of all arterial roads (most of the trunk roads and some main roads, but very few district roads), the creation of high-standard, all-weather gravel roads and many more high-water structures. In 1952, Namibia had just over 10.000 km of trunk and main roads. There were no surfaced roads and very few suitable bridges. Since that time a remarkable development has taken place. The length of proclaimed trunk, main and district roads, the three roads classifications for which the state is responsible as far as construction and maintenance are concerned, has risen between 1952 and 1986 from a little more than 10.000 km to 41.572 km. This development is pictured in tables below:

TABLE 1 STATUS OF NATIONAL ROADS: ODENDAAL PLAN

Proposed Road Network: 1963 Status of the Existing Roads: 1979

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1. Kuruman-Gochas-Mariental Main road up to Mariental and then Windhoek arterial
 2. Upington-Karasburg-Mariental Arterial road to and from RSA
 3. Springbok-Vioolsdrift-Grünau Arterial road to and from RSA
 4. Oshikango-Ondangwa-Windhoek Arterial road
 5. Ruacana-Kamanjab-Otjiwarongo Main road and arterial road
 6. Ombombo Owambo-Katima Mulilo Secondary road except the Oshikuku-Ondangwa main road and Ombombo-Tsandi "other road"
 7. Kamanjab-Kaokoveld (Opuwa) Main road
 8. Otavi-Grootfontein-Rundu Arterial road
 9. Link to Tsumkwe Main road
 10. Otjiwarongo-Okakarara Arterial and main road
 11. Okahandja-Khorixas-Sesfontein Combination of main, secondary and -Orupembe "other road"
 12. Keetmanshoop-Berseba Arterial and main road

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13.Swakopmund-Cape Cross-Kunene Main road to Henties Bay, then secondary road to Terrace Bay, then "other road",Kunene not reached

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NOTA: The Commission recommended the immediate paving of roads No. 1-3, and portions of roads No. 4 and 8.

TABLE 2 NAMIBIA: ROAD NETWORK BY ROAD CATEGORIES (km)
1953 1973 1986 1953-73 1973-86

Trunk Roads	3.008	3.600	4.040	+592	+440
Main Roads	7.312	9.248	8.936	+1.936	-312
District Rds	14.336	19.627	28.596	+5.291	+8.969
Sub-Total	24.656	32.475	41.572	+7.819	+9.097
Farm Roads	24.432	25.408	22.058	+976	-3.350
Grand Total	49.088	57.883	63.630	+8.795	+5.747

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NOTA: Department of Transport: September 1986 including Walvis Bay

TABLE 3 NAMIBIA: THE ROADS SYSTEM ON A DISTRICT BASIS, 1986

DISTRICTS	PROCLAIMED ROADS NETWORK		DENSITY		PER	
	TOTAL(km)	PAV(km)	(km/km ²)	POPULAT.	VEHICLE	
Bethanien	1.056	65	0,06	320	1,61	
Bushmanland	677	0	0,04	233	-	
Damaraland	1.822	22	0,04	63	2,05	
Gobabis	3.321	108	0,08	128	0,74	
Grootfontein	2.031	356	0,08	79	0,44	
Hereroland East	1.500	0	0,03	67	6,74	
Hereroland West	920	0	0,06	50	1,29	
Kaokoveld	1.661	0	0,03	85	2,92	

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Karasburg	2.264	342	0,06	204	1,20
Karibib	909	175	0,07	87	0,65
Kavango	1.043	137	0,02	8	5,03
Keetmanshoop	2.277	239	0,06	110	0,47
Lüderitz	668	125	0,01	40	0,16
Maltahöhe	1.524	33	0,06	272	1,68
Mariental	3.585	332	0,08	148	0,83
Namaland	2.075	173	0,10	137	-
Okahandja	1.641	193	0,09	104	0,44
Omaruru	684	86	0,08	107	0,61
Caprivi	780	122	0,07	17	0,76
Otjiwarongo	1.614	342	0,08	85	0,39
Outjo/Kamanjab	1.711	274	0,04	164	0,86
Owamboland	1.927	435	0,04	4	0,30
Rehoboth	1.015	171	0,07	31	0,55
Swakopmund	1.001	73	0,02	55	0,16
Tsumeb	1.149	203	0,07	50	0,27
Walvis Bay	86	47	0,08	5	0,01
Windhoek	2.629	349	0,08	20	0,05
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TOTAL	41.572	4.402	0,05	34	0,35

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NOTA: Statistics for September 1986 with inclusion of Walvis Bay, population numbers from the 1981 census adapted with an estimated growth of 3,5% p.a, vehicle numbers per district from table 5 were multiplied with 8% to make provision for an average of 9.255 government, army and police vehicles from the total of 120.170 vehicles in Namibia with the inclusion of Walvis Bay; PAV=Paved. Table 4 indicates that Windhoek and Walvis Bay districts have the shortest road length per vehicle unit, implying heavier traffic

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volumes in these centres with dense population concentrations. Namaland has the greatest road length per unit area, Bethanien the greatest and Owamboland the smallest road length per unit of population, implying that the area with the highest population numbers in Namibia has the greatest backlog in roads.

Today Namibia is served by 41.572 km of trunk, main and district roads, which as far as construction and maintenance are concerned are the sole responsibility of the Department of Transport [101]. A further 22.058 km of farm roads are proclaimed in terms of Ordinance 17 of 1972, as amended (Roads Ordinance of Namibia), but are not the responsibility of the Department of Transport. To sum up, a total of 63.630 km are proclaimed trunk, main, district and farm roads, of which 4.402 km are surfaced roads (14,5 km to freeway standard). It has, however, to be stated that these 4.402 km surfaced roads and a further approx. 185 km roads which are presently under construction at surfacing standards are carrying approximately 70% of the total traffic generated in Namibia (approx. 2.000.000 vehicle - km/day on surfaced roads and 800.000 vehicle-km/day on earth and gravel roads) [102].

The next table gives the roads classification according to their different pavement types:

TABLE 6 NAMIBIA: ROADS ACCORDING TO THEIR PAVEMENT TYPES

DESCRIPTION	DISTANCE (km)
PAVED ROADS TOTAL	
TRUNK ROADS	4.402,01
MAIN ROADS	3.291,36
DISTRICT ROADS	1.057,97
UNPAVED ROADS	
GRAVEL ROADS TOTAL	
TRUNK ROADS	23.505
MAIN ROADS	749
DISTRICT ROADS	7.692
EARTH ROADS TOTAL	
TRUNK ROADS	13.019
MAIN ROADS	-
DISTRICT ROADS	15
GYPSUM/SALT ROADS TOTAL	
TRUNK ROADS	228
MAIN ROADS	-
DISTRICT ROADS	71
SANDSPOOR ROADS TOTAL	
TRUNK ROADS	418
	-

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MAIN ROADS	-	
DISTRICT ROADS	418	
TOTAL 41.572 km		

NOTA: Departmental statistics for the period between March 1986 and September 1986 and including Walvis Bay

Notwithstanding this extensive roads system, there is still a great deal to be done, i.e. rural feeder roads for the development of agriculture and agro-based industries, especially in Owamboland, in Okavango and the Caprivi, have to be built. A sizeable number of human settlements in these areas have no access to any classified road. There are also serious deficiencies in external links with independent African countries to the north and especially to the east.

In the modern sector of Namibia the road network seems to be more than adequate. The Annual Average Daily Traffic (AADT) volumes are, except in some areas of high industrial, commuter and weekend/holiday traffic, surprisingly low. There are very few roads carrying more than 500 vpd [103]. Many high standard roads are quite under-utilised ensuring slow wear and tear with resulting relatively low maintenance costs.

As far as vehicles are concerned the occupation of the road network is, as indicated above, very low and varies between 15% on arterial roads and 1% on secondary roads. It has to be accepted that a rural two-lane-surfaced road can, dependent on local conditions, carry between 9.000 and 14.000 vehicle units per day in both directions. During a traffic count together with a road freight survey during August 1984, the highest traffic loadings have been encountered on the three trunk roads around Windhoek [104].

Traffic loadings on these three trunk roads changed from 1.200 to 1.800 vehicle units per day in both directions. All other roads in Namibia, except main road 92 between Ondangwa and Oshakati in Owamboland, where a traffic count of 1.600 vehicle units per day has been established, revealed less than 1.000 vehicle units per day. On 1 April 1986 the total number of vehicles in Namibia was established at 120.170 vehicles, which includes 9.255 government, army and police vehicles [105].

A matter to be taken into consideration in regard to the utilisation of roads is the design life span of a road. Road foundation layers are designed in accordance with the expected number of axles, at a standard axle load, which will use the road during its expected design life span. According to estimates made by the Department of Transport, there is no reason to believe that the existing road network will weaken considerably under the proviso that sufficient resources for maintenance works will be made available by the Namibian Government and heavy traffic will not increase dramatically in the future [106].

In the former homelands the basic infrastructure still consists (except some isolated arterial roads like the trunk roads Oshivelo -

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Ondangwa - Oshikango, Grootfontein - Rundu - Bagani- Katima Mulilo - Ngoma and the main roads Ondangwa - Oshakati - Ruacana, Kamanjab - Opuuo and Rundu - Nkurenkuru) of mainly secondary roads (district roads) and "other roads". In the modern sector of Namibia the extensive network of well maintained district roads provides useful extensions to the major road network which is further supported by an extensive system of farm roads.

Given the level of the roads system, especially in the modern sector, major expansion and improvement will not so much be of a priority except in the above mentioned examples. However, one of the challenges for the independent Republic of Namibia is the construction of low-cost roads with Namibia-Adapted-Techniques, especially rural feeder roads, in the hitherto underdeveloped "homelands". The "white" population group did not only gain from better access to better roads but "modern-sector-contractors" also gained from the hitherto highly sophisticated equipment-orientated construction methods employed. These did not contribute a great deal to create more permanent employment possibilities. These capital- and machine-intensive construction techniques also suppressed the application of labour-intensive road maintenance.

In the mean time most of the trunk roads and some of the main roads are surfaced roads. All the layerwork data of these surfaced roads are stored in an extensive databank, the " Pavement Management System", in the Central Computer System of the Department of Transport. Generally these surfaced roads consist of a light blacktop application on natural gravel bases and subbases. Most of the unsurfaced main roads are engineered gravel roads, and most of the district roads improved earth roads.

The above tables indicate that Windhoek and Walvis Bay districts have the shortest road length per vehicle unit, implying heavier traffic volumes in these centres with dense population concentrations. Namaland has the longest road length per unit area, Bethany the longest and Owamboland the smallest road length per unit of population, implying that the area with the highest population numbers in Namibia has the greatest backlog in roads.

Not only was the construction of new and the maintenance of existing roads the main task in the recent past, but also the safeguarding and improvements of Namibia's roads system asset, namely:

- widening and rehabilitating of existing surfaced roads;
- strengthening and resealing of existing surfaced roads and bitumen surfaces;
- improvement and alterations of road alignments of existing roads;
- strengthening and widening of inadequate bridges and culverts;
- safety measures, namely guard rails, road marking/adequate road signs etc.

The pace of progress cannot be overlooked - it has not been achieved easily or cheaply. The problems and difficulties which the Roads Department in its first 28 years and subsequently the Department of Transport since 1978 [107] encountered were sometimes demoralising, often unique and always onerous. Namibia is a land of many faces:

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from inhospitable desert and hard rocky outcrops to rugged mountains and undulating plains. Each of these presented different problems to the road builder - some areas are barren and waterless, while others offer - and this is one of the biggest structural problems - no conventional road building materials. Substitutes had to be found, new techniques had to be devised and applied, and many innovations had to be developed. Due to its experience in unused and widely diversified conditions, the Department of Transport of the Ministry of Works, Transport and Communication of the Republic of Namibia is today recognised as a world authority on certain aspects of African road construction [108].

As mentioned above, Namibia has more kilometres of road per head of population than any other country in Africa, including the Republic of South Africa. But, nevertheless, much remains to be done - existing roads have to be maintained and this is a steadily increasing heavy financial and technical burden. The present state of unequal development of the roads infrastructure means, however, that assessing accessibility of the "common man in street" to means of road transport suggests poorer access, especially in the Namibian north, than in many other independent African countries. At the end of the evolution of Namibia's roads system it has to be concluded that the bridging of this imbalance will be one of the great challenges of independent Namibia in the 1990s and thereafter.

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