KENYA RURAL ROADS AUTHORITY

THE LOW VOLUME SEALED ROADS 10,000 PROGRAMME (LVSR)

Road Construction from a Historical Perspective

In Kenya, a substantial proportion of the rural road network of approximately 132,000Kms out of a total 136,794Kms is generally earth or gravel standard. To date approximately 20,000km of the entire road network in Kenya has been improved to bitumen standard. Majority of the road network is in poor condition and is frequently adversely affected during heavy rains; causing high transport costs and unreliable access. At the same time, there is increased demand for improved access and mobility from rural communities to support primary growth sectors of the economy as well as improve their socio-economic conditions. Roads are vital to economic development, but can be very expensive, especially if the pavement is not properly designed. It is therefore important that suitable methods of design are used and materials selection done carefully for the wide range of road classes and conditions.

Road Construction Presently: Why the Low Volume Seal Approach?

The Government pledged 10,000Kms of roads to open up rural areas, decongest major towns, and promote domestic and regional connectivity. Consequently, all road agencies including the Kenya Rural Roads Authority (KeRRA) embarked on a programme on the development of roads using the Low Volume Seal technology. This programme is known as the 10,000km Low Volume Seal Roads Programme (LVSR). LVSR is aimed at achieving a substantial leap in delivery of the Government's development goal for the roads sub-sector in a cost-effective way. The LVSR Programme is guided by guidelines developed by the Materials Testing and Research Division based on Road Design Manual Part III: Materials and Pavement Design for New Roads, 1987. This is meant to prevent overdesign.

Conventional methods of road construction in many instances ensured high design speed roads with the resultant requirement for horizontal and vertical realignment leading to high cost of construction and in many cases the need to acquire land, relocation of services and resettlement of people. Subsequently, through the LVSR technology, the cost of road construction in rural areas has been reduced by more than 60 per cent since in many cases the cost of earthworks is reduced while there is no need for land acquisition and reduced relocation of services as the road follows the existing alignment.

The Road Design Manual Part III has successfully been used over time but has limitations regarding provisions for pavement structures for traffic loading below 250,000 Cumulative Equivalent Standard Axles (CESA). Further, the pavement structures provided for traffic loading between 250,000 and 1,000,000 CESA are mostly overdesigned, being based on the upper limit. Roads with traffic below 250,000 CESA could therefore not be designed to paved standards using the manual and have had to be designed for improvement to gravel standards. However, construction of gravel roads is becoming increasingly expensive and
unreliable because of depletion of the existing gravel sources and high rates of gravel loss due to traffic attrition and environmental factors. This method is therefore not sustainable and as such calls for a different approach to construction and maintenance of our roads.

It was therefore imperative to adopt a design that enables upgrading of low volume roads to sealed/paved standard to increase the pavement life to at least 15 years thus lower whole life costs. The guidelines developed provides for upgrading of low volume roads to paved standards while optimising the use of locally occurring materials.

**LVSR R10,000 Programme: Progress to Date**

In using the Low Volume Sealed Roads technology, the Authority has two programmes namely the R2000 LVSR strategy (Labour Based) and the R10000 Programme (Machine Based). Under the R2000 LVSR strategy (Labour Based), the Authority has ongoing contracted works of approximately 100Kms while under the R10,000 Programme (Machine Based), the Authority has 4,009Kms of on-going contracted works at a cost of Ksh180 billion and approximately 5,485Kms being at various stages of procurement.

The R10000 Programme is milestone-based consisting of two components namely: road construction and performance-based maintenance contracts. The effect of this is that after construction and expiry of the twelve (12) months Defects Liability Period, each road contract contains a maintenance provision that will ensure the road is maintained for a period of thirty six (36) months by the contractor unlike previously where the Authority would be responsible for the maintenance of the road. Currently approximately 128Km of roads have been upgraded to bitumen standard under the LVSR programme.

**LVSR R10,000 Programme: The Future**

The LVSR programme is projected upon completion to inject a total of 10,000km of new roads upgraded to bitumen standard. It has been established in previous economic studies that with proper investment, a vibrant roads infrastructure can generate up to 5% of the Gross Domestic Product (GDP). As articulated in the Road Sector Investment Plan (RSIP, 2011), for every shilling invested in roads; the country stands to gain two shillings and fifty cents in benefits.

It is therefore apparent that the successful implementation of the programme will enable KeRRA to achieve its vision of providing an adequate, safe and efficient rural road network and continue to contribute towards achievement of the strategic vision of the Government of Kenya for the roads sub-sector as captured under key policy documents including the Road Sector Investment Plan and the Kenya Vision 2030.

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