



An Investigation on Remaining Service Life of Rural Roads

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ABSTRACT :

This document has been prepared as part of the technical assistance provided by the International Labor Organization to the Prime Minister's Rural Road Programme (PMGSY). This technical collaboration with the National Rural Roads Development Agency is funded through the financing provided by the World Bank to the Rural Roads Project. Road construction work is well documented in India through an extensive library of technical guidelines, manuals and specifications. As such, the quality standards of road works are well detailed and resulting in high quality outputs reflecting the functional objectives of such guidelines. Road maintenance forms part of the works carried out to provide adequate transport infrastructure. From a technical point of view, there is no shortage of technical guidance on how the works should be carried out. The challenge seems to be more related to how maintenance should be organized and when it should be carried out. The technical aspects of road maintenance are addressed in several good publications guiding the provision of a functional rural road network in India. A number of these documents are referred to in this Guide. The intention of this document is however not in any way to replace any of the literature currently available on this topic but rather to complement it by presenting a series of good practices and management arrangements that have proven effective in terms of providing timely maintenance to rural roads. As such, it is important to point out that the Guide has been prepared with the knowledge that elaborate road maintenance management systems have already been introduced in several states. This document makes no intention to replace those systems but rather attempts to place further attention to the importance of such management arrangements. This Guide has been prepared with inputs from the technical assistance team of the ILO in close consultation with technical staff from the various road agencies in the participating states of the Rural Roads Project.

INTRODUCTION :

Rural road maintenance in the Asia region. The term "rural roads" is often used imprecisely. Some countries use it to define all roads which are not national or secondary roads. Others lump together tertiary roads, which are part of the publicly owned network, with other local roads which are not included under the responsibility of the government. In this paper rural roads have

been defined as all public owned roads whose primary purpose is to provide purpose is to provide direct access for rural village and communities to economic and social services. Since the early 1980s massive investments have been made in rural roads. There were several reasons for this. In the first place it was a natural extension of investment into the lower parts of the road networks given the major investments that



had been made in the national highways of most of the countries of the region. It was therefore a logical step to develop the whole of the road network. Underlying this was a belief that rural roads and the vehicles that traveled on them would provide the catalyst for increased economic activity in the rural areas. It also responded to the change in development thinking towards a belief in the necessity to develop the rural areas so that agricultural production is stimulated and to ensure that jobs and livelihoods are created locally to limit the urban drift. The development of the rural road network was seen as, if not the prime mover in this, certainly an important facilitator. Indeed the justification for rural road investments was, and to some extent still is, based on their effect on the rural economy. With the emphasis on rural development came a major investigation of the dynamics of the rural areas. This included an assessment of the role of rural transport in the economic and social activities of the rural population. It became clear from this work that rural transport involved much more than roads and motorized vehicles and that it had a major part to play in the social activities of the rural population.

The investments made in rural roads therefore seemed to be justified not only in purely transport planning terms but also in both economic and social returns that could be expected from these investments.

This new investment in rural roads was almost totally concentrated on new construction and improvement works. The fact that the expansion of the road network would require additional funds for its maintenance was, if not ignored, considered a separate issue that could be dealt with at a later stage. Unfortunately this coincided with several other factors which

contributed to a lack of concern for maintenance. Firstly, the funds for road construction came from the capital development budget whilst funds for maintenance were expected to be sourced from government recurrent budgets. Often the investments for road building were financed by bilateral donors or from loans from the international development banks. Whilst the funding agencies often insisted that conditions were included in the agreements regarding the Governments' commitment to maintenance, limited efforts were made to enforce such commitments. If the maintenance dimension was raised in relation to these programmes, it was commonly referred to as a government commitment without any further concerns to either funding or to the capacity to ensure that maintenance actually took place. Secondly, the introduction of maintenance on these roads was not considered a serious problem, in the sense that there was very little money involved and it was often assumed that the authorities would automatically take on this responsibility. Politicians however were more interested in opening new roads than maintaining existing ones. Public road building agencies were also largely unaccountable for the problems caused by the lack of maintenance. In addition, rural road maintenance did not provide an interesting career path for engineers. Finally, there was little understanding that effective maintenance required a certain level of technical and administrative capacity. In general, this did not exist to any significant degree as maintenance was considered as a secondary issue. It should be added that, often, maintenance is not considered as a recurrent, preventive activity but a curative measure when the road has significantly deteriorated.

Definitions and Understanding of Maintenance

The basic objective of road maintenance is implicit in the word itself. It is done to ensure that the road that has been constructed, or improved, is maintained to the extent possible in its original condition. All roads require maintenance as they are subjected to traffic and the forces of weather. Even with the highest possible quality of construction, maintenance is essential to get optimum service from the road structure during its life period. By applying preventive maintenance, the deterioration of the road and all its components can be slowed down and thus postpone the need for costly investments in rehabilitation.

Maintenance requirements depend upon a number of external factors such as traffic, terrain, soil types and climate. The need for maintenance is also very much determined by the original technical designs applied during the construction of the road, and the quality of the works carried out during the construction works. Depending on these parameters, it is possible to devise maintenance solutions and corresponding management systems which optimize maintenance costs and efforts.

Rural roads constitute the majority of roads in the national network in most countries. They normally cater for a limited volume of traffic, and therefore require relatively unsophisticated technical designs. However, due to their large numbers and wide geographical distribution, they create very distinct challenges to their management and operation.

Timing of Maintenance Inputs

Routine maintenance is a recurrent activity. Careful timing of work inputs forms an

important part of an efficient maintenance programme. The prime objective when scheduling maintenance works is to ensure that the works are carried out as preventive measures, at an early stage when the road deterioration and damage are still limited. The works are therefore scheduled at strategic intervals when it is expected that the need for action is essential. For this reason, the timing of regular, or routine maintenance works are often related to the time of the year when rainfalls occur.

The most common work activities are:

- ✧ Erosion control on shoulders and slopes;
- ✧ Clear drains to allow free passage of water;
- ✧ Clear culverts and other waterways;
- ✧ Minor repairs to culverts and retaining structures;
- ✧ Repair and replace scour checks;
- ✧ Repair, fill and compact potholes and ruts;
- ✧ Grass and bush clearing;
- ✧ Repair road signs.

FAILURE OF RIGID PAVEMENTS

The defects apparent on rigid pavements may be due to deterioration of the concrete, restrained volume-change stresses, or overload evidenced by pumping and/or structural breaks .

The basic distress in concrete roads is formation of cracks. Uncontrolled transverse and longitudinal cracks that occur during concrete pavement construction are due to various reasons and full-depth repairs are the only solutions in



most of the situations. Further, unfortunately some concrete pavements do not crack at the saw cuts and instead crack at unplanned locations. The common terms for these early cracks are “random cracks” or “uncontrolled cracks.” The reasons for uncontrolled cracks are due to factors like saw timing, saw cut depth, weather & ambient conditions, conditions of base and sub base, quality of concrete, joint spacing, rapid evaporation of surface moisture and so on.

Concrete structure is an assembly of operating systems that experience temperature, air pressure and vapor pressure gradients. Seasonal and diurnal fluctuations in outdoor conditions provide variability and direction of the gradients and these operating conditions can aggravate or accelerate premature failure of the structures. Concrete roads are vulnerable to attacks from atmospheric agents

SITUATION ANALYSIS

Rural roads are a fundamental element in the provision of access in the rural areas. However, such access has to be sustained otherwise the benefits will be lost. To be able to make meaningful suggestions regarding the provision of effective maintenance it is necessary to have an understanding of the current situation. This chapter looks at the physical, institutional and financial issues related to rural road maintenance in the region.

The Road Network

Roads are considered to be crucial to economic and social development. It is surprising therefore that the data on roads in the region are not only difficult to find but also questionable regarding their veracity. Data on the national

highways is relatively abundant, however the further one progresses down the network the more difficult it is to find reliable statistics.

Rural roads form part of an overall network and they are dependent on the higher order roads to serve their purpose and vice versa. In the first place it is useful therefore to see rural roads in the overall context of the road networks of the region.

SUMMARY AND CONCLUSION

The single most important issue related to the provision of rural road maintenance is the lack of capacity at the decentralized levels. Only in rare cases has the devolution of responsibility been accompanied by the requisite capacity to shoulder that responsibility. Even if there was a political will, even if attitudes towards maintenance changed and even if finance was available, the implementation of effective maintenance would not be done unless the appropriate capacity existed.

There is a desperate demand to strengthen local government capacity to carry out maintenance. The capacity needs to be matched with resources and clear targets and performance standards against which the local technical agencies are evaluated.

There is a general perception that maintenance is an activity that needs to be done when things go wrong. This may be in part cultural. You go to the Doctor when you are sick; you mend your car when it breaks down. To change this attitude as regards to rural road maintenance at the local level requires more than exhortations and instruction. Vested interest plays a major part and if the key people involved do not

see the benefit to themselves they are unlikely to respond to these pleas.

For politicians the benefit may be in demonstrating that not only are they preserving assets but employing local people by doing so - and this at a very low cost. However it would be wrong to place the blame only on the politicians. The roads fraternity has to embrace the concept that maintenance expenditure, though relatively small, is more important to the nation than expenditure on new construction. This not only places maintenance in a more acceptable light but also provides the basis for lobbying for additional funds for maintenance. After all it is a national tragedy that a major national asset, the rural road network is deteriorating at such a rate.

REFERENCES

- [1] ADB. Road Funds and Road Maintenance. ADB 2003
- [2] ADB. When Do Rural Roads Benefit the Poor? ADB 2006
- [3] ADB. Reports and Recommendations to the Board for several projects
- [4] Andreski, Seth and Walker. How a Road Agency can Transform Force Account Road Maintenance to Contracting. World Bank 2006
- [5] 5.Brenneman. Infrastructure and Poverty linkages. World Bank 2002
- [6] 6.Burningham and Stankevich.Why road maintenance is important and how to get it done. World Bank Transport Note TRN 4 2005
- [7] 7. Carapetis, Levy, Wolden. Road Maintenance Initiative: Building Capacity for Policy Reform. World Bank
- [8] 8. Chandrasekhar. Maintenance of Rural roads - A case study of the PMGSY. Paper for the IFG technical meeting 2005
- [9] 9.Department of Agriculture, Philippines. Maintenance of barangay and farm to market roads. 1998
- [10] 10. Development Cooperation Committee. Guiding Principles on Using Infrastructure to Reduce Poverty. OECD 2005
- [11] 11. DILG, Phillipines. Road Maintenance Management Manual. 1993
- [12] 12. Donnages. Improving Access in Rural Areas. ILO ASIST AP 2003