

Annex : road maintenance definitions and practices

Common definition

A common understanding of road maintenance implies to address the issue of the understanding of the term "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 in its original condition. It is accepted that over the life of the road it will deteriorate due to factors with which maintenance activities cannot deal. Nevertheless maintenance is intended to begin on the first day after the road improvement works are completed.

In practice the effect of regular and timely maintenance is to increase the life of the road by putting off the date at which it needs to be reconstructed. This has several benefits, the prominent being that it stretches the period over which the benefits of the investment made are available and therefore provides a higher rate of return on the initial investment. In addition, it puts off the date when large investments have to be made to reconstruct the road. As the yearly cost of maintaining a road is a small fraction of the investment cost, usually some 2-3%, the economic logic for effective preventative maintenance is undeniable. It can indeed be argued that the construction of roads, whilst consuming large amounts of money, is of limited importance if there is no effective maintenance system.

For reasons that are difficult to assess, however, road maintenance is often viewed as an activity that is carried out only when the road is damaged. As no one would apply this approach to his house or even his own health, it is strange that it seems to be a pervasive attitude in the road sector.

The situation is particularly critical with unsealed roads. Here the main enemy of the road is water

The whole concept of rural road building is to get the water as quickly and efficiently as possible away from the road structure. This means that the camber of the surface, the slope of the shoulders, the side drains and cross drainage structures need not only to be constructed effectively but also need to be kept in a condition that will permit the free run off of the water away from the road. This means that the road once constructed has to be looked after on a regular basis. This is why routine maintenance is so important and is the core of an effective maintenance system. The term Recurrent maintenance is sometimes used to cover certain activities (such as light grading) which are carried out during the year over and above the activities of routine maintenance. Periodic maintenance is an activity that is undertaken every 3- 5 years and is concerned with rectifying defects which are outside the scope of routine maintenance. Routine maintenance however remains the key activity. It is the least costly but provides the greatest benefits.

Maintenance, being a recurrent activity, should be financed from the recurrent budget. The funds allocated to it should relate to a maintenance plan which defines those roads in a maintainable condition and, using standard figures for routine, recurrent and periodic maintenance, produces a recurrent cost for the network.

Unfortunately, as in many other countries, road maintenance is not viewed as recurrent activity. It is viewed as a set of projects to be carried out on roads which, because of lack of maintenance, have deteriorated to a state where they need improvement.

The present description of road maintenance in the budget reflects the curative rather than preventative approach to maintenance.

There is therefore a major effort required not only to develop an effective and realistic rural road maintenance system but also to create a maintenance culture along the lines described above.

Defining road maintenance

Road maintenance is not described in any conventional manner: one budget line is **8CRE Roads repair**, which can obviously not be interpreted in routine and preventive maintenance

In order therefore to ensure that we are all talking the same language, we have felt it necessary to define the terms we have used when discussing rural road maintenance.

We would suggest that, in keeping with an approach which is preventative rather than curative, maintenance should be defined as follows:

Routine Maintenance - required continuously.

- non-pavement related; required continually on all roads in maintainable condition (good and fair) during the year irrespective of traffic volume or engineering characteristics.
 - Activities include: grass cutting, bush cutting, drain clearing, ditch cleaning, culvert cleaning, road sign cleaning, repairs of minor damage to side slopes, levelling of shoulders and verges.
- pavement related; required at intervals during the year with a frequency depending on condition of the pavement and traffic volume/composition.
 - Activities include: for paved roads, repairing pot-holes, patching, for unpaved roads, repairing pot-holes,

Recurrent Maintenance – required at intervals during the year

- Activities include:
 - for paved roads, edge repairs, crack sealing, line marking,
 - for unpaved roads, grading or dragging.

Periodic Maintenance Operations - required at intervals of several years.

- for paved roads: resealing, regraveling of shoulders, line marking.
- for unpaved roads: regraveling or replacement of unbound macadam pavements.

Emergency Maintenance Operations – required to deal with emergencies where immediate action(s) is required to ensure road user safety.

- Activities include removal of debris/obstacles, clearing of land slides, repairs to localised damaged road sections/structures.

In an effective system routine maintenance would be the core activity and emergency maintenance would consume only a small portion of the budget.

This is not the current situation in Vanuatu.

In an effective system, the order of priority of maintenance activities would be as follows:

1. **Routine drainage works** including clearing of ditches, clearing of culverts, clearing of bridges, clearing of river channels, repairs of erosion damage, repairs to scour checks and other minor drainage structures, repairs of culverts and other large structures, repairs of embankment slopes, etc.,
2. **Routine pavement works** including filling of potholes, repairs to shoulders, etc.,
3. **Recurrent maintenance grading** - gravel surfaced roads only,
4. **Other routine maintenance works** including grass and bush cutting, cleaning, repairing, replacing road signs, etc., and
5. **Periodic maintenance works** including regraveling, etc.

Budget and means to fund and execute such maintenance scheme must be based on :

- a detailed condition inventory of all the roads in the Province, with classification according to the Road Act;
- an assessment of the cost of putting the core network into a maintainable condition;
- an assessment of the routine maintenance costs, means and procedures
- an assessment of the periodic maintenance and means

Funding of Road Maintenance

The current situation regarding the budgeting of road maintenance could not be defined unless the network which is in a maintainable condition is known : the actual size of the network is not known with any precision nor its actual condition.

Any discussion of maintaining the totality of the network is therefore at this stage an academic exercise.

Another way to look into the issue is, if the level of maintenance funding is known, to figure out the length of the network that can be maintained according to known cost of routine and periodic maintenance of roads.

