

## IMPLEMENTATION OF SECONDARY ROAD MANAGEMENT SYSTEMS IN BELGIUM

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### INTRODUCTION

Belgium has a population of ten million inhabitants and an area of thirty thousand square kilometers. Its secondary road network consists of 115,000 kilometers of public roads. Less than 5% are unpaved, and about 26,000 kilometers are made up of cement concrete. If one adds to it the state network which is just over fourteen thousand kilometers, one obtains the highest world road density of 4.2 kilometers per square kilometers of territory.

This network performs the following functions:

- Local access to grounds and housings, residential quarters, agricultural lands, industrial zones (connecting roads);
- Collecting local traffic in order to feed it to the primary road network (collecting roads); and
- Linking villages together and also with principal administrative, industrial, and commercial centers (transit roads).

These roads have been progressively deteriorating owing to a lack of appropriate maintenance. The major effort at country level has been focused until recently on construction and improvement of the primary road network.

### MANAGEMENT OF SECONDARY ROADS

The management of the secondary roads is the responsibility of the provincial administrations (for the provincial roads) and the communes or municipalities (for the parish roads and the local unclassified network). The burden of budgetary restrictions induces the need to make use of integrated maintenance and rehabilitation management systems.

Conditions of use by local agencies and features of the systems have been identified. Such systems should enable road managing authorities to assess their networks objectively, to rank road sections according to the severity of distresses, to optimize the short and medium-term programming of maintenance budgets and works (on a period basis of three to six years), by choosing the best available strategy for upgrading actions, to justify the efficiency of investments and most

important to estimate the extra cost which would result from failure to carry or to postpone maintenance.

Maintenance in this context includes also activities of rehabilitation (improving on structural conditions, strengthening, and reconstruction). Routine maintenance and local repair action are usually carried out on force account basis: generalized repairs and strengthening are produced by contract. The application of the management systems should therefore also attract the interests of contractors by providing means to identify works and their correlative needs in resources and to market their activities.

### Management Systems

Management systems must be simple, flexible, and allow the user to add new criteria to the pre-programmed data base of technical and economic criteria. Such systems should be designed to be applicable to towns, municipalities and non-urban low-volume roads (with levels of traffic of the order of 2000 vehicles per day or less), but should also be of use by private road managers. Management systems must be applicable to both bituminous and cement concrete surfacing.

An elaboration of such a system by the Belgian Road Research Center was based on an intensive sample data collection regarding the nature and the local condition of the Belgian secondary road network. Feedback from three pilot tests was incorporated in configuring the system.

### GERSEC

The system, called GERSEC, integrates technical approaches and economical evaluations with a view to optimize the distribution of the available funds at the network level.

The activities developed within the system are the following:

- Overall assessment of the road network;
- Detailed assessment of a part of the network selected by the local agency (visual inspection of the extent of defects and roughness monitoring);
- Interpretation of the results;

- Maintenance and rehabilitation policy proposals for the selected network; and
- Production of work programs and scheduling.

The maintenance and rehabilitation policy proposals for the network include a choice of priorities based on the optimization of cost effectiveness. The benefit considered in the cost-effective evaluation is that of increased residual service life of the pavements. This has been preferred to other types of benefits such as the ones based on user's costs or level of service standard. A study was initiated to compare the results obtained by the GERSEC system with those of applying the World Bank's HDM III model. Basically, both came to the same conclusion.

An alternative system is being evaluated to limit the assessment of road condition only to visual inspection (both extent and severity of defects). The latter will most suitably be applied to the lower traffic level roads and is thought to be a less expensive data collection process. The optimization process used which is derived from a cost-effect matrix maximization is fundamentally different from the one applied in the GERSEC system (which involves optimization of global quality index thresholds).

The application of the GERSEC system is at present performed on a consultancy basis at the intentional request of communes. Legal enforcement of the use of management systems is presently being investigated particularly in view of warranting maintenance subsidies. Fortunately there is a legal obligation now to manage the communal patrimony on a computerized basis. This situation is favorable to the full implementation of road management systems.