Road Management Systems

Importance of road management systems

To properly decide on a maintenance policy, choose between alternatives, input data into deterioration and economic models such as HDM (Highway Development and Management), and finally come up with maintenance programming, it is necessary to rely on a good knowledge of the main characteristics of a road network and transport system over time. The main purpose of road management systems or pavement management systems (PMS) is to provide data and tools fitted for this issue.

The development of PMS in many countries is most often the consequence of the awareness of severe gaps concerning basic data characterizing the network, such as traffic volumes, structure and deterioration indicators, roughness indices, etc. At the same time, the increasing use of tools like HDM or various other maintenance optimization programs makes it necessary to catch up with the delay in this field.

Implementing a road maintenance system mainly consists in:

- taking into account the whole of a network through the use of a road data base;
- seeking a maintenance strategy corresponding to an economic optimum, by simulating the consequences of various alternatives;
- developing a sound maintenance multi-annual programming method.

Some difficulties attached to the development of road management tools and PMS exist; they can be overcome but specific attention must be paid to some important topics:

Data collection process: the scope of data and parameters likely to be collected in order to feed a data base is wide: traffic, technical data, road characteristics (geometry, deterioration, structure, etc). Nevertheless it is important to bear in mind that the (i) possibility of getting reliable values in the field must be thoroughly investigated and the corresponding collection methods assessed and tested, (ii) the data set feeding the system must be in line with the general aims of the maintenance policy and with the programming tools as well, (iii) the ranges of accuracy attached to all the parameters must be consistent, (iv) data monitoring and updating methods have to be defined and implemented .

Therefore the initial design of the PMS is crucial to avoid further failures and the subsequent necessity to permanently revamp the system.

Analysis and reporting

Many road management systems are not really helpful because they generate inappropriate outputs; this is mostly due to insufficient analysis and erratic reporting. For example, in several countries where a PMS has been implemented, after several years it is still impossible to get a picture of traffic structure and growth trends, although traffic counts covering a significant period of time are in PMS computer files.

The skills of the staff assigned to road management offices may be questionable; this makes it crucial to assess the skills and identify appropriate training from the very beginning of the system implementation. Some mistakes often occur in relation with a poor assessment of the nature and scale of the analysis likely to be carried out: as a planning tool, the PMS refers to road networks, either regional or national; it cannot be used as a substitute for detailed project studies, which remain necessary and will require more sophisticated data.

It is also observed that too many PMS are to some extent "self-contained": They do not interact with the maintenance policy really applied in the field. This may be due to some of the technical reasons exposed above, but the explanations are also institutional and political: the attempt to rationalize maintenance planning can be a source of conflict of interests at various levels, and the Authority in charge of maintenance policy and planning must show a real determination to give a PMS its best chance to succeed.

The Indonesian Road Management System (IRMS) is the result of many years of development of successive computerized models, which balance road user cost savings due to better roads against cost of road improvements based on a regular assessment of current road conditions. The models have been developed by the Ministry of Public Works mainly with the support of the World Bank and cover all road categories, including kabupaten roads. They produce an annual works program and budget. The works program is flexible according to the available budget, but is always based on optimizing the trade off between user cost and cost to the Government.

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