

Elements Of Pavement Management

Once a road has been constructed or reconstructed, the condition of the pavement will begin to change over time, due to the effects of weather, environmental factors and traffic loads. Weather factors include the amount of rain/snow, temperatures (particularly extreme heat and cold), humidity, freeze -thaw cycles, exposure to sunlight, etc. Environmental factors include soil types. Traffic load includes some function of traffic frequency and the weight of the vehicles.

There are also combined effects between these two main factors. Heavy and frequent traffic loadings while the pavement is more vulnerable due to severe weather will cause more damage than the same loadings during favorable weather. In addition, several other factors can contribute to the rate at which pavement deteriorates. These include:

- Type, condition, and moisture content of the sub grade soil,
- Type, thickness, and strength of the base materials,
- Timing of preventive maintenance fixes, and
- Quality of construction.

According to the American Association of State Highway and Transportation Officials (AASHTO): “Those who work with pavements know that after a pavement is built, traffic and environmental loadings create unavoidable stress that will eventually reduce the condition of the roads to a point where they will not be usable without maintenance. They also know that early treatment will extend the life of some pavement.”¹

Preventive maintenance programs are designed to extend the life of good pavements by applying low cost, short term treatments. Preventive maintenance projects are low cost projects intended to protect an existing pavement structure, slow the rate of pavement deterioration, and/or correct overall deficiencies in the pavement surface. The benefit of preventive maintenance activity can best be realized if an agency applies treatments to a pavement in good condition. Preventive maintenance treatments cannot be targeted to the worst roads, but must be made to those in fair or good condition which have defects that if left unattended would require much more costly repairs.

The challenge for most agencies is to determine when in the life of a pavement is the best time to apply a preventive maintenance treatment for the maximum benefit.

Preventive maintenance is perhaps the single most influential component in the network strategy, that allows an agency to manage pavement conditions. It creates the ability to postpone costly reconstruction or rehabilitation activities, by extending the remaining service life of the original pavement.

A significant benefit of a comprehensive preventive maintenance program is that it gives managers control over future network conditions and funding requirements. By controlling future network conditions, decision makers can anticipate routine maintenance work loads, safety deficiencies, and ride quality needs. Several studies have found that a dollar invested in preventive maintenance will save from \$4 to \$6 in future reconstruction or rehabilitation costs.