

ABSTRACT

A maintenance management system is disclosed for staffing highway maintenance crews using discrete-event simulation and optimization techniques. Conveniently, the system is organized in four stages; making determinations, model building, simulation model, and experimentation and analysis. Determinations support setting agency's own standards regarding maintenance including identifying maintenance specialties, establishing standard crews, setting standard productivity rates, estimating optimum maintenance workloads, estimating costs of delaying maintenance, and deciding the planning period. Model building involves outlining the repair request system including highway system configuration, organization structure, crew assignments, input data, and maintenance model. The simulation model executes an initialization routine and events and runs the events through a time and event schema until the event queue in the simulator is emptied. The experimentation and analysis stage includes designing experiments, generating data, and employing optimization techniques to determine the optimum size of the maintenance staff.