

# IMPROVING ROAD STRIPING OPERATIONS THROUGH SYSTEM OPTIMIZATION

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## ABSTRACT

The Missouri Department of Transportation (MoDOT) performs many maintenance operations including road line striping operations. Pavement striping needs to be reapplied on a regular basis. Each year, MoDOT has to stripe more than 60,000 line-miles of roads. Also, in some cases they are required to paint newly constructed or maintained roads within a seven day period following construction completion. These requirements generate the potential for inefficiencies in the form of “deadhead miles” that road striping crew vehicles must travel while not actively applying pavement markings. Moreover, due to the slow-moving nature of road striping vehicles, it’s often necessary to park them at “overnight” locations at end of each working day. This adds more “deadhead miles” at the start and stop of each day into total travel distance. Currently, managers and engineers of MoDOT manually create the striping schedule (sequence) for each crew based on their experience and judgement.

The main idea of this research is to develop an optimization model that identifies optimal routing and scheduling of road striping crews. This model will include scheduling (optimal striping sequence of road segments) of the crew for each working shift, choosing the best “overnight location” (maintenance sheds or bulk storages) for each day, identify the best starting point for the next day. Overall, it will minimize the “deadhead miles” travelled by crews, improve the utilization of striping equipment, and decrease cost of striping operations. This optimization tool will help to managers of MoDOT automatically find an optimal schedule whenever striping requirements change.