

## EXECUTIVE SUMMARY

Recent studies have shown that aggregates are potentially in short supply over about one-third of the US; southern Iowa is included in these areas. Among the most effective approaches to the alleviation of the aggregate shortage problems are: (a) better utilization of locally available aggregates, (b) expanded use of marginal materials (including better materials evaluation and specifications), and (c) the benefaction of otherwise unsuitable materials. These have been the ultimate goals of this project, with respect to absorptive aggregates.

In this study, the asphalt absorption of six Iowa limestones were investigated. It was found that the most important factors that determined the nature, amount, and rate of asphalt absorption are porosity and pore-size distribution of the aggregate, viscosity of the asphalt, and time. Methods needed to determine the realistic maximum and minimum asphalt absorption by aggregates are recommended. Simple methods of asphalt absorption were developed. Since the most important factor that determines the accuracy of asphalt absorption is the bulk specific gravity of aggregates and since the current ASTM method is not adequate in this respect, several new methods were developed. Preliminary treatment studies for the purpose of upgrading absorptive aggregates were conducted using close to 40 chemicals. The improvements of some of these treatments on the mixture properties were demonstrated.

In order for the information generated by this research to be used by the highway engineer to judge the suitability of aggregates and to upgrade the unsuitable or marginal aggregates with respect to asphalt absorption, further research areas have been recommended.