

The Need for Competition

When sustained competition exists in a market, the price for similar goods is expected to go down. Research underway at MIT illustrates how this economic principle holds true with paving materials. Initial findings suggest that increasing competition between paving material industries lowers the paving unit costs of both asphalt (AC) and concrete (PCC)—which could result in significant savings for state departments of transportation (DOTs) and taxpayers.

States of Competition

While DOT spending on concrete and asphalt paving materials varies greatly, all states spend most of their

paving budgets on asphalt pavements for DOT projects. In many states, virtually no competition exists between these two paving industries (see **Figure 1**).

What Determines Material Unit Costs?

To understand how certain factors—including inter-industry competition—impact paving material unit costs, researchers analyzed 10 years of pavement construction bid and materials pricing data from 47 state DOTs using a statistical model. They considered a number of items, such as the amount of paving material used on a project, the number of bidders on a project (a metric of intra-industry competition), and the average share of spending in a state on concrete (a metric of inter-industry competition).

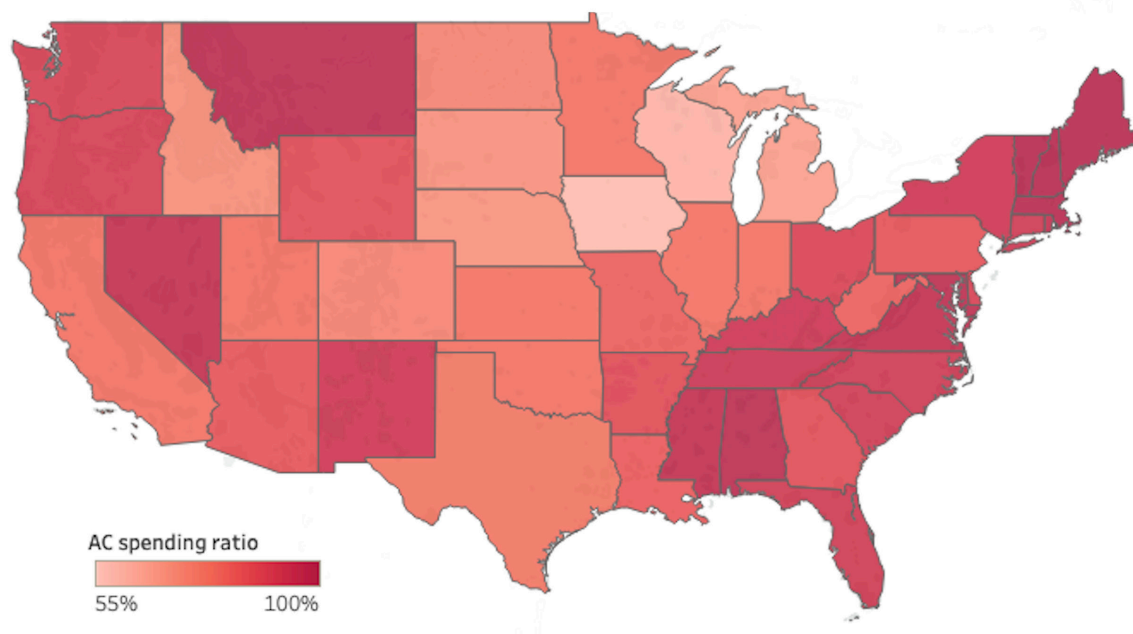


Figure 1. A map of the continental United States showing the share of pavement spending on asphalt (AC) for state DOT projects in each state (except NJ) between 2005 and 2018.

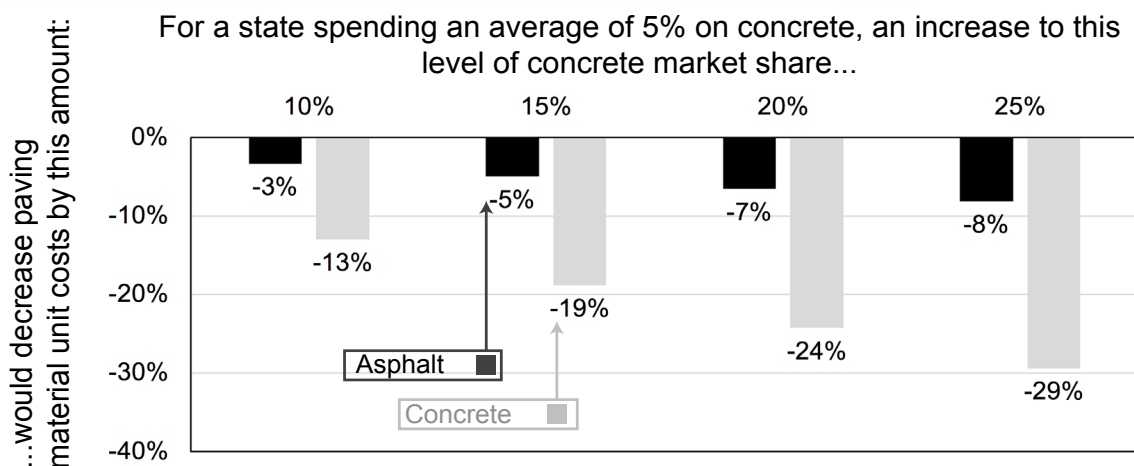


Figure 2. The relationship between inter-industry competition and paving material unit costs for AC (asphalt) and PCC (concrete) pavements across all states. These results assume that asphalt is the dominant material in the market.

The statistical analyses found that the most influential contributors to concrete paving material bid unit costs, in order of significance, were (1) project size, (2) inter-industry competition, (3) market size, and (4) intra-industry competition. For asphalt paving material bid unit costs, the most significant contributor was also (1) market size, followed by (2) inter-industry competition, (3) project size, (4) intra-industry competition, and (5) the presence of price-adjustment clauses, which are used primarily for asphalt paving prices.

Greater Competition, Lower Costs

After identifying the significance of inter-industry competition, researchers estimated how changes in it would alter unit costs.

In a case study, they found that as inter-industry competition increased in asphalt-dominant markets, the unit costs of concrete and asphalt paving materials fell significantly—particularly those of concrete. **Figure 2** shows that if concrete’s market share increased from 5% to 25% in a given state, concrete and asphalt paving material unit costs would decrease by around 29% and 8%, respectively.

These lower unit costs, researchers estimated, would also increase the supply of paving materials by 6.5%

(see **Figure 3**). Consequently, more paving could occur for a fixed budget.

As DOTs face increasing backlogs and potential fiscal crises, their responses need not be too complex or even radical. Two proven materials, when used in tandem, can allow DOTs to do more with less.

Key Takeaways:

- Inter-industry competition is one of the most influential contributors to paving material unit costs.
- By increasing concrete’s market share to 25%, the unit costs of concrete and asphalt materials could fall by around 29% and 8%, respectively.
- This decrease in unit costs would increase material availability by around 6%, enabling more paving on a fixed budget.

Related Links:

- [CSHub Pavements Research](#)
- [CSHub Competition Research](#)
- [Journal Article: O.A. Swei et al., “Effects of Industry Competition in the Paving Sector”, Under Review.](#)

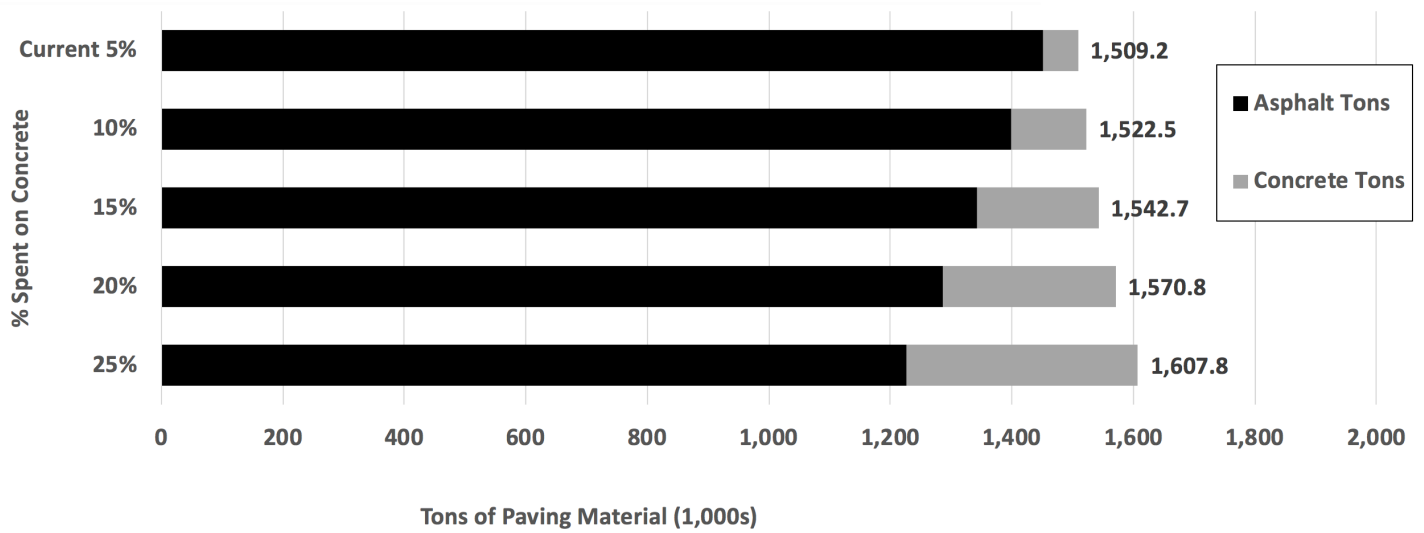


Figure 3. The relationship between inter-industry competition and the amount of paving that can be done for a \$100M budget in a state currently spending 5% on concrete.

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