

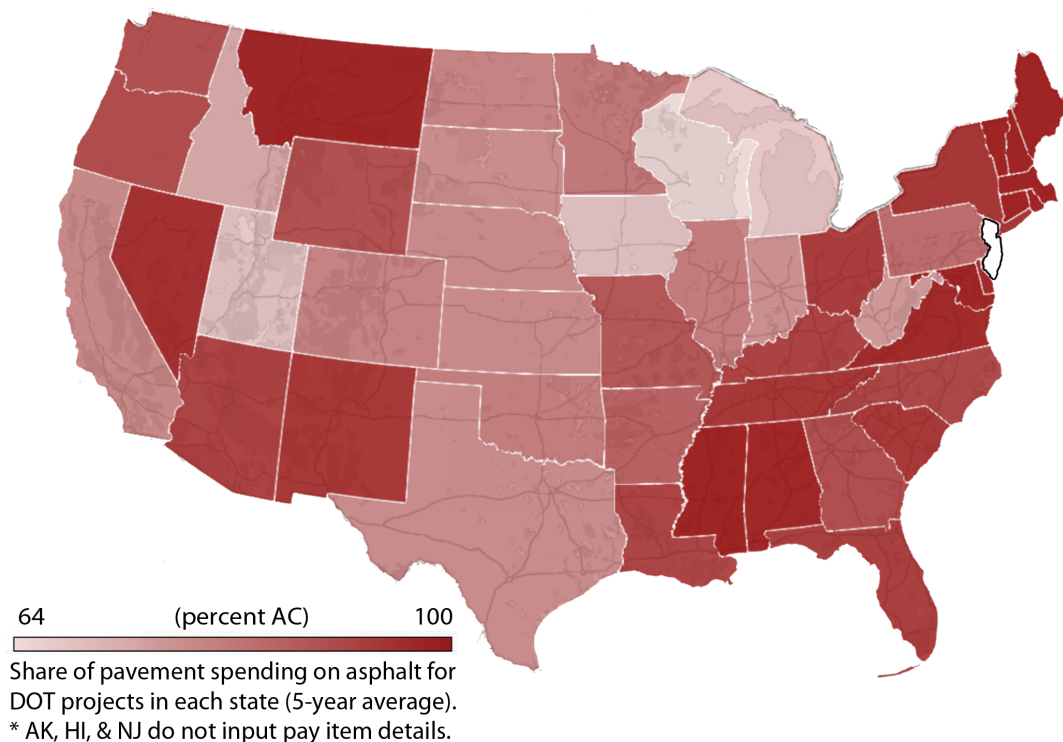
Measuring the Impact of Competition on Paving Material Prices

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 principal holds true with paving materials. Initial findings suggest that increasing competition between paving material industries lowers paving unit prices for both asphalt and concrete – which is likely to result in significant savings for both DOTs and taxpayers.

THE CURRENT STATE OF COMPETITION

Spending on concrete and asphalt paving materials varies greatly from state-to-state.

However, an analysis of spending over a five-year period showed that all states that reported data spent at least 64% of their paving budget on asphalt pavements for DOT projects. There are several states where virtually no competition exists between these two paving industries.



* AK, HI, and NJ do not input pay item details.

THE RESEARCH

MIT researchers sought to understand which factors have the most influence on pavement prices by statistically analyzing historical pavement construction data in the U.S.

- Using the Oman BidTabs database, researchers collected 10 years of pavement construction bid and materials pricing data from 47 state DOTs.*
- The data represented approximately 298,000 pay items from 164,000 projects; these items were filtered to exclude activities not directly relevant to paving (e.g., curbs, drainage).
- Statistical models were developed to determine what factors have a statistically significant influence on paving material prices, including 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).

SUMMARY OF KEY DRIVERS

MIT researchers identified the factors that have the most influence on paving material bid prices through the use of statistical models.

- The most influential factors driving **concrete** paving material bid prices are project size, followed by **inter-industry competition**, market size, and intra-industry competition.
- The most influential factors driving **asphalt** paving material bid prices are the market size, followed by **inter-industry competition**, intra-industry competition, and the presence of price-adjustment clauses, which are used primarily for asphalt paving prices.

Significant factors	Impact on asphalt prices	Impact on concrete prices
Market size: annual spending on paving	+++	++
Project size: volume of paving material used in job	--	---
Inter-industry competition: percent annual spending on concrete	--	--
Intra-industry competition: number of bidders on a job	-	-
Presence of price adjustment clauses in a state: allow contractors to adjust prices after the initial bid	-	N/A

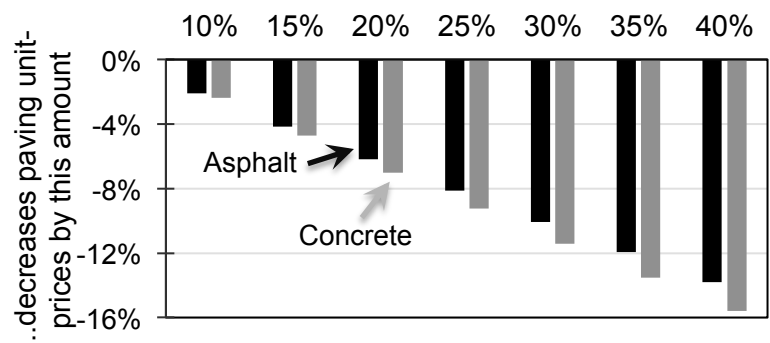
Key: An increase in a factor marked with **- lowers** paving prices. An increase in a factor marked with **+ raises** paving prices. More markers indicate more significance.

IMPACT OF COMPETITION

MIT researchers used the statistical model to estimate the impact of increasing inter-industry competition on paving prices.

The estimates demonstrate that increasing **inter-industry competition** has the potential to significantly lower both asphalt and concrete paving prices.

For an average state spending 5% on concrete, increasing to this level of concrete spending...



Publications

Swei, O., Miller, T.R., Akbarian, M., Gregory, J., and Kirchain, R. "Effects of Industry Competition in the Paving Sector," *Under review*.

Additional information may be found at: <http://cshub.mit.edu/>