

Preservation: Are 'Public-Private Partnerships' Cutting Costs?

By Panagiotis Ch. Anastasopoulos, Matthew Volovski, and Samuel Labi

For preserving pavements, highway agencies may seek the participation of the private sector in order to raise revenue, share risks and reduce project delivery costs.

Public-private partnerships (PPPs) are an increasingly common approach for project delivery. To address the lack of a rational decision-support structure for choosing between PPP and traditional contracting approaches for a specific pavement preservation project, we demonstrate a framework that assesses the relative performance of PPPs.

In this context, performance is expressed in terms of the likelihood and amount of cost savings associated with the PPP.

CONTRACT WORK DEFINED AS PPP

A public-private partnership (PPP) [here] is generally defined as a contractual agreement formed

EDITOR'S NOTE: In this paper, the authors refer to any contract work for a road agency as a "public-private partnership." Conventionally, a PPP is a privately funded transportation facility, authorized by a government agency, and operated as a toll concession for a set period. Rather than severely alter the content of this valuable and meaningful contribution Pavement Preservation Journal has retained their original wording.

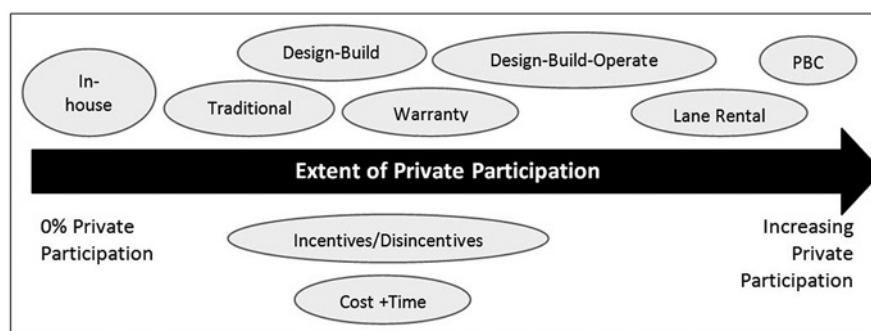


Fig. 1: Approaches for project delivery (not to scale)

between public agencies and private sector entities to allow for greater private sector participation in the delivery of transportation projects. We consider any pavement preservation activity that is delivered by any approach besides in-house is considered to be a PPP.

PPPs can help public agencies accelerate project delivery by utilizing private sector strengths in packaging and procuring services in innovative ways, and in providing specialized skills, equipment, and processing. PPPs allow public agencies to reduce their size or to function effectively with a dwindling workforce, particularly in the current era that is characterized by incipient retirement of the baby boomer generation.

A framework would help the agency identify the most cost-effective contracting approach for a given pavement preservation

project on the basis of the project characteristics; predict/quantify the consequences of any contracting option in terms of the cost savings or other agency-specified performance criteria; and to identify/quantify the influence of project attributes such as the expected project duration, work type, and project size on the performance of each contracting type.

PROJECT DELIVERY APPROACHES

Fig. 1 presents a few of the contracting approaches that can be used for the delivery of highway preservation projects.

The work completed during the in-house project delivery approach for preserving highway pavement is carried out by the agency's in-house personnel using the agency's equipment and materials on a force-account basis.

In the traditional contracting approach, the facility design phase is carried out independently of the construction phase. The contract is awarded to the best qualified bidder.

Cost-Plus-Time (A+B Bidding, or Multi-Parameter Bidding), is a contracting approach that not only considers the initial construction cost in the bidding process, but also takes into account the time needed to complete the project. In order to estimate the cost of time, a road-

user cost (\$/day) is determined and multiplied by the required number of days for completion. The contract is then awarded on the basis of the combined cost of time and construction material and services. Safety, quality, social impacts, and other factors can be incorporated into the cost-plus-time contracts to form multi-parameter contracts.

Other contract permutations include Cost Plus (Cost Reimbursement) contracts, Incentives/

Disincentives, Lane Rental, and Performance-Based Contracts.

For the probability that a given type of PPP approach would yield cost savings (or cost loss) vis-à-vis the in-house approach, the binary probit model was used. All model variables are statistically significant at the 90 percent level of confidence, and the signs are intuitive.

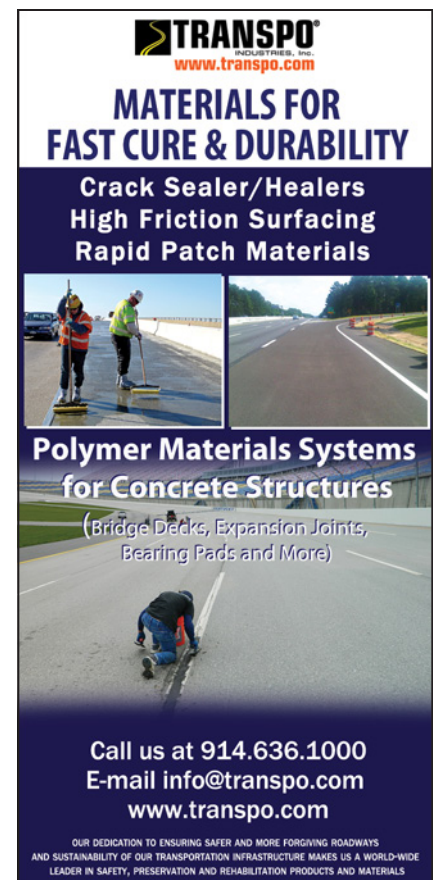
DATA COLLECTION, ANALYSIS





This study used data from 138 pavement preservation contracts that were let or completed in the United States and abroad (Africa, Asia, Europe, North and South America, and the Pacific) between 1996 and 2007 inclusive. The data were collected from internet resources and a number of transportation agencies in the United States and abroad.

The results suggest that the A+B+I/D and PBC contracts for pavement preservation generally have a greater probability of cost savings compared to the traditional contracts.




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The results also showed that the warranty contracts for pavement preservation generally have a lower probability of cost savings compared with their traditional counterparts. This is consistent with expectation: Anastasopoulos et al. (2011) and Singh et al. (2007) found that in the short term, warranty contracts are generally more costly, per lane-mile, than otherwise similar traditional contracts.

Also, it is seen that pavement preservation contracts that are less than 10 miles in length generally have a higher amount of cost savings compared to those that are over 10 miles in length. Also, pavement preservation contracts that are let using PBCs were generally found to yield higher amounts of cost savings compared to other contracting approaches; the contrary effect was observed for similar work done through warranty contracting approaches. Also larger contracts (size exceeding \$1 million) were found to be associated with higher amounts of cost savings relative to smaller contracts (smaller than \$1 million).

CONCLUSIONS AND RECOMMENDATIONS

This study carried out econometric analyses to identify the factors that influence the likelihood and amount of cost savings associated with PPPs relative to the in-house approach for pavement preservation projects.

Unlike past, similar research, cost savings is defined in this paper not in relation to lowest bid costs but as the percent cost difference between the PPP contracting approach and its in-house counterpart.

The developed models can be used in a PPP evaluation and decision-support framework to predict the performance (such as the cost savings likelihood and amount) of alternative contracting approaches. This would benefit highway agencies and international organizations who seek to identify the superior contracting option (PPP or otherwise) for a given pavement preservation project on the basis of the project characteristics,


and to quantify the consequences of such choices in terms of the cost savings or other agency-specified performance criteria.

However, final recommendations for a given project should only be made after weighing carefully other considerations such as local site conditions or social and political culture. Through such a tool, agencies' public accountability could be enhanced as the consequences of alternative contracting options could be more clearly communicated

to the general public, taxpayers or to sponsoring institutions. 

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