

# Project Title: EVALUATION OF PUBLIC-PRIVATE PARTNERSHIP CONTRACT TYPES FOR ROADWAY CONSTRUCTION, MAINTENANCE, AND REHABILITATION

Principal Investigator: Panagiotis Ch. Anastasopoulos, Ph.D.

## Introduction

Public-private partnerships (PPPs) in transportation infrastructure projects refer to contractual agreements formed between a public Agency and a private sector entity to allow for greater private sector participation in project delivery. At the current time, most Agencies do not have a set of straightforward guidelines by which they decide whether to adopt PPP for a given project, and if to adopt one, which type of PPP should be adopted. Before such a decision can be made in an informed manner, the Agency needs to develop and implement a PPP evaluation and decision-support framework that will incorporate the PPP costs and benefits. Such costs and benefits can include the Agency costs and user costs occurred at the time of the project as well as the risk costs borne by the Agency. This study develops a PPP evaluation and decision support framework, supported by an Excel-Based Expert System, which Roadway Agencies can use to decide whether to adopt a PPP for a given project, and if affirmative, what type of PPP to adopt, such that there is maximum benefit to the Agency.

## Findings

In this study several statistical models were estimated for various measures of effectiveness (cost savings, cost overrun, time delays, change orders, asset condition, safety, and operations) by PPP contract type (performance based contracting, incentives/disincentives, lane rentals, warranties, design-build and its derivatives, cost-plus-time, and traditional contracting), and by geographical regions (at the continent, region, country, and US-state levels).

These models provided an appropriate context for developing an Excel-based expert system which can be useful for Agencies to select the most beneficial contracting approach for a certain transportation project. The results illustrate that, in cases of the tight schedules and complicated designs, PPP contracting has advantages over traditional contracting approaches. On the basis of the selected evaluation criterion, the best contracting approach that is identified for a given set of project characteristics is found to be heavily influenced by certain project attributes, such as project cost, size, types of constituent activities, and expected duration.

## Study Implementation

The study product can be used by highway agency asset managers as a decision-support tool to identify whether to adopt a PPP for a given project, and if affirmative, the specific type of PPP that could yield the greatest net benefits to the agency. Implementing the study product is expected to provide decision-support at highway agencies who continually seek not only to infuse greater transparency and accountability in their investment decisions, but also to provide cost-effective and well-balanced decisions in terms of various criteria (i.e., cost, time, safety, operations, asset condition, etc.).

Sponsors: **REGION II UNIVERSITY TRANSPORTATION RESEARCH CENTER**

Completion Date: **December 31, 2015.**

University: **University at Buffalo, The State University of New York**

