

## **INNOVATIVE CONTRACTING STRATEGIES FOR COMBATING CLIMATE CHANGE**

### **Problem**

Under the State's "Smart, Green & Growing" initiative, SHA is committed to reducing greenhouse gas (GHG) emissions from on- and off-road vehicles and equipment. To meet the commitment and address associated challenges, the agency needs to develop innovative contracting strategies and integrate construction firms' equipment and material usage into its emission reduction program.

### **Objective**

The research project aimed to investigate innovative green contracting strategies in highway development and improvement projects. Specifically, the research was expected to explore the state of practice, identify green contracting strategies, and evaluate the viability and applicability of green contracting strategies to SHA projects.

### **Description**

A survey of State Departments of Transportation (DOTs) was conducted in order to determine the current practice, procedures, drivers, project delivery methods, compliance issues and challenges for implementing green contracting strategies. Five leading State DOTs were further examined in terms of legislative, organizational, and technical requirements for green contracting implementation. Case studies of previously conducted projects and an extensive literature review were undertaken to identify best practices on green project delivery. The research team defined a Green Performance Contracting (GPC) framework with 19 green performance contracting strategies classified into four groups: 1) material related strategies; 2) equipment and energy efficiency strategies; 3) green life cycle strategies; and 4) clean energy development. Nineteen GPC cards including sample contract provisions were developed to assist public agencies to better understand and implement these strategies.

A decision model based on the Data Envelopment Analysis technique was developed to assist public agencies in selecting GPC strategies according to seven evaluation criteria namely emission reduction potential, financial consideration, technological maturity, organizational readiness, industrial and public acceptance, impact on project performance, and risk and uncertainty. An analysis was conducted to determine the efficiency and viability of implementing GPC strategies at SHA.

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## Results

The study shows that State DOTs have varying degrees of experience regarding the use of green performance contracting strategies in highway projects. It is feasible and promising to integrate green elements into projects of various sizes and different project delivery systems. The primary form of green performance contracting is through contract specifications, although other forms have been successfully used in a few states. With an increasing interest in implementing green performance contracting on highway projects, however, there is a substantial lack of common terminology, guidelines, and standards.

The study recommends that transportation agencies create agency-wide initiatives to promote sustainable practices at the project level. The initiatives can be led by an environmental division (e.g. NY), a planning division (e.g. CA), or a special office (e.g. IL). It is critical that the public agencies partner with the construction industry and strengthen their technical and institutional capacity to ensure successful implementation. The 19 GPC strategies and decision model developed in this study provide technical guidance to agencies that wish to make improvements in this area.

There are several GPC strategies that are immediately applicable to SHA projects and could greatly reduce GHG emissions from SHA projects. These strategies including using alternative fuels, establishing an engine retrofit program, and renewable energy development. The study recommends that SHA integrates these strategies into its project development process. Furthermore, SHA can establish its role as a national leader by promoting sustainability in project development and developing green performance specifications and implementation guidelines.

## Report Information

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