



Center for Transportation
Research and Education

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RESEARCH PROJECT TITLE

Performance Effectiveness of Design-Build, Lane Rental, and A + B Contracting Techniques

SPONSORS

Minnesota Department of Transportation

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CTRE

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The mission of the Center for Transportation Research and Education (CTRE) at Iowa State University is to develop and implement innovative methods, materials, and technologies for improving transportation efficiency, safety, and reliability while improving the learning environment of students, faculty, and staff in transportation-related fields.

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Performance Effectiveness of Contracting Techniques

tech transfer summary

Innovative contracting methods can help improve the effectiveness of designing and delivering road construction projects.

Objectives

- Evaluate the performance, cost, and value of A + B contracts, design-build contracts, lane rental contracts, and traditional contracts.
- Compare types of contracts across specific variables, including administrative and project costs, management complexity, disruption to third parties, road user cost (RUC), innovation, product/process quality, and funding flexibility.
- Validate techniques recently approved by the Federal Highway Administration.
- Provide a best practices guide with project selection criteria.
- Promote continuing development of innovative techniques, such as design-sequencing and A + B + C contracting.

Problem Statement

Many governmental agencies charged with delivering public infrastructure have been experimenting with innovative contracting methods over the last several years. One particular federal program, Special Experiment Projects – 14 (SEP-14), has helped to accurately define and clarify many new innovative contracting methods to ensure that the processes and practices involved with innovative contracting are implemented effectively. The primary objective of SEP-14 was to review specified innovative contract techniques as they were applied to specific projects, which were monitored closely to measure the effectiveness of innovative contracting compared to the traditional design-bid-build method or other acceptable methods. The specific innovative contracting methods under investigation included the following:

- A + B with an incentive/disincentive (I/D) option
- Lane rental
- Design-build

Innovative contracting methods have been practiced for several years in many states, and the federal government has recognized and defined many standards for innovative contracting. Therefore, instead of comparing these three innovative contracting methods to the traditional method of delivery, it is important to examine and compare the effectiveness of these three methods to each other.

Research Description

For this project, the researchers surveyed national experts in construction engineering about innovative contracting preferences; reviewed relevant literature; examined case studies of three A + B projects, one lane rental project, and one design-build project in the state of Minnesota; and interviewed personnel from at least one project for each of the innovative contracting methods under investigation.

Key Findings

- A + B contracts received the highest effectiveness score for each of the project types. Moreover, the differences in mean effectiveness scores were statistically significant in all comparisons of A + B to other contract types, except for major corridor realignment/expansion projects, where the design-build mean effectiveness score was not significantly different from that of A + B.
- A + B contracting is considered capable of creating the greatest value when all relevant performance factors are considered.
- I/D clauses should be used in conjunction with A + B contracts, especially on projects with high RUC's or critical completion dates.
- Design-build contracting is considered highly effective for urban projects of high complexity.
- Co-location of the design-builder with project personnel and their representatives and project-level authority proved to be very successful best practice strategies.
- Emerging innovative methods, such as design-sequencing and A + B + C contracting, appear to be promising future research sites.

Implementation Benefits

Using innovative contracting methods will improve the overall effectiveness of designing and delivering road construction projects.

Implementation Readiness

Learning about and applying innovative contracting methods requires the development of coordinated joint training programs for personnel and improvements in recruitment, selection, and assignment procedures. However, with the support of ongoing research, the necessary cultural change is being facilitated, currently allowing innovative contracting to be implemented nationwide on a growing basis.



Major highway construction near Des Moines, Iowa



Quality control on concrete pavement construction project