

TECHNICAL SUMMARY

Louisiana Department of Transportation and Development In-house Versus Consultant Design Cost Study

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INTRODUCTION

Since the early 1980's, state departments of transportation have generally contracted out an increasing proportion of their road and bridge design projects to consultants. A number of studies have been conducted to determine whether this has been a cost-efficient tactic. In an effort to determine the relative cost of designs by in-house staff and consultants in Louisiana, the Louisiana Department of Transportation and Development (DOTD) commissioned a similar study in 1997.

OBJECTIVE AND SCOPE

The objectives of the study were to identify and compare the cost of providing engineering design services to Louisiana DOTD when these services were provided by in-house staff or consultants and list other factors that are relevant to establishing an optimum balance between the use of in-house staff and consultants.

The scope of the project was limited to the comparison of cost of road and bridge designs conducted in the previous five years. Costs were determined from the perspective of cost to DOTD and included all direct and indirect costs associated with the task, including contract preparation, supervision, insurance, office rental, utility costs, etc.

RESEARCH APPROACH

The research approach adopted in this study was to review past methodological approaches as reported in the literature, to formulate a new methodology using the best from past studies including improvements where possible, and to apply the new methodology in conducting a comprehensive cost comparison of design costs in Louisiana.

Past findings

Reviewing literature back to 1977 identified 17 studies that have investigated the relative cost of in-house to consultant design costs for state (DOTs). Of these, 14 concluded that consultants were, on average, more expensive. Two were unable to distinguish a cost difference while one found consultants to be cheaper. Of all 17 studies, six were conducted by the state (DOTs) themselves, four by other public bodies, four by universities, and three by private firms. In all but one case, the studies were commissioned by state (DOTs). Thus, some bias in the findings may be anticipated and yet the weight of findings is so overwhelmingly in favor of consultants being more expensive that it suggests that this may be generally true.

Methodological Issues

One disconcerting feature that emerges from past studies is the range of findings they display. Collectively, they suggest consultant design costs range from being "cheaper" in one study to 240 percent more expensive than in-house design costs in another. Two major reasons for this state of affairs is that important cost factors have been omitted in some studies and the means of measurement has not been consistent.

Suggested Methodological Improvements

In the study conducted for Louisiana DOTD, a concerted effort was made to include all relevant cost factors into the analysis. In addition, attention was given to ensure that the cost items were comparable. For example, office rental and utility costs, often excluded from in-house costs, were included in this study. Insurance, which is usually inflated to cover tort liability for public institutions, was modified to reflect the same sort of professional indemnity covered in consultant insurance schemes.

The methodology and means of measuring design costs has varied among studies in the past. Most studies have compared pairs of projects with one member of the pair being designed by in-house staff and the other being a similar project designed by a consultant. Others have compared groups of projects designed by in-house staff or consultants without attempting to ensure whether the projects are similar or not. In each case, design cost has usually been measured as a fraction of construction cost or in terms of dollars per plan sheet. Conceptually, the most equitable comparison of design costs involves measuring design costs of a representative sample of pairs of projects of the same type, size, and complexity. A reasonably easy way of achieving this is to draw representative samples of projects designed by in-house staff and consultants in the past, note their design costs and use the design cost-estimating procedure used by most state (DOTs) to estimate fixed fee payments to estimate the cost by the other group. In this way, two design costs are obtained from each project. Collectively, the projects are representative of in-house and consultant projects.

Application in Louisiana

This approach was used in the study conducted for the Louisiana DOTD. A sample of 20 in-house and 17 consultant designs conducted in the previous five years were used to establish 37 pairs of design costs. For each pair, comparative design costs were measured as the ratio of in-house to consultant design cost. The analysis showed that, on average, in-house design costs were approximately 80 percent of consultant design costs. However, most of this difference was not in labor rates, hours worked, or overhead costs but in the cost of contract preparation and supervision of consultant effort.

CONCLUSIONS

All past studies have recognized that it is impossible to make a definitive statement of in-house versus consultant design costs because the magnitude of many cost items is open to interpretation. However, the overwhelming majority of past studies as well as the study conducted in Louisiana suggest that in-house design is indeed cheaper. At the same time, cost comparison should not be the sole criterion in deciding on an appropriate level of consultant use. Factors such as accommodating peak demand, meeting deadlines, gaining access to special expertise, supporting a healthy consulting industry, and maintaining in-house expertise deserve attention too.

RECOMMENDATIONS

1. DOTD should consider all relevant factors in deciding on an appropriate level of use of consultants in design work.

2. Design contracts should be awarded primarily to those consultants whose past design performance has been favorable and who have required minimum departmental supervision in the execution of the design.
3. The recording of in-house design time should be improved.
4. A computerized information system capable of providing effective project cost control and management should be developed.

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