



Research Need Statement 554

Date:	June 20, 2018
Need Statement Champion:	LRRB – Brainstorming – Fausto Cabral (D6 State Aid) David Kramer – Winona County Greg Isakson – Goodhue County Mike Pretel - Metro State Aid
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Idea Submitted by:	SRF Consulting Group, Inc. – Michael Marti
Idea Originated from:	LRRB 2018 Brainstorming

Select Program:

- MnDOT OR Local Road Research Board (LRRB)
 Research OR Implementation

Need Statement Title:

Construction Incentives – Are They Working?

Need Statement: Describe the problem or the opportunity. Include background and objective.

<p>Incentive/Disincentive contracting is a process where the contractor is paid an incentive for meeting a performance specification (e.g. pavement density, ride quality or completing a project earlier than the time specified in the contract). If the contractor doesn't achieve these performance specifications, then disincentive monies are subtracted from payments due. Incentive/Disincentives can be used in a wide variety of projects and is best applied when an agency is willing to pay the contractor to expedite the work and/or ensure getting quality work.</p> <p>Benefits</p> <ul style="list-style-type: none"> • Increase quality and/or reduced construction time. • Potential for lower contract administration costs • Improved public relations by information businesses/residents that you are committed to completing the project as quickly as possible. <p>Drawbacks</p> <ul style="list-style-type: none"> • May require additional funding • Contract changes can lead to disputes regarding incentive payments <p>This process is often used on MnDOT projects; over the last several years local governments have begun using. Several local government agencies are now wondering how effective this type of contracting is; specifically asking:</p>
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- Is there value in using incentive-based contracting?
- Can the efficiency of construction incentives be measured?
- Some elected officials are resisting using incentives; their attitude is: “Why should we pay extra (incentive) for something we expect?”
- Does it help in differentiating contractors and assist in selecting “good” contractors? Some local agencies believe good contractors will submit a lower bid with the strategy that they’ll do good work and will achieve the incentive.
- How much additional value does this add? Increased pavement quality? Time savings?
- Does a project with a bid incentive provide more value?
- Concerns that some local agencies are modifying the incentives (increasing/decreasing density values) creating non-uniformity and confusion for contractors.

A survey of local governments to collect data/details on projects that have used incentives contracting is necessary to conduct a cost-benefit analysis. Additionally, local governments should be interviewed to learn more details about the incentive contraction experiences, including issues/concerns. This data should then be used to determine the benefits of incentive contracting to local agencies.

Provide a summary of the potential benefits:

Typically, incentive contracting process is more expensive (as compared to normal contracting); currently, there are questions as to the benefits of incentive-based contracting for local governments projects. The benefit of this research project is that it will help local agencies understand if there is a true benefit to them in using incentive-based contracting; and if so, answer when it is best used.

How does this project build upon previous research (include title or reference to a completed research effort)?

Although no recent local research has been done, in 2009 the LRRB funded a research implementation report entitled, “*Innovative Contracting Methods.*” It did not include incentive contracting. A literature searched did identify several national documents that should be screened/reviewed as part of this projects.

- [Synthesis of Information Related to Highway Problems. Topic 47-09. Effective Practices for Establishing Contract Completion Dates for Highway Projects](#) FHWA, ongoing-began in 2015
- [Quantifying the Impact of I/D Contracting on the Time/Cost Trade-Off for Pavement Rehabilitation Projects](#) ASCE, 2016
- [Impact of I/D Contracts Used for Expediting Michigan’s Road Construction](#) Michigan DOT, 2015
- [Decision-Support Framework for Quantifying the Most Economical Incentive/Disincentive Dollar Amounts for Critical Highway Pavement Rehabilitation Projects](#)

Provide names to consider for a technical advisory panel:

Fausto Cabral (District 6 State Aid), David Kramer (Winona County), Greg Isakson (Goodhue County), Mike Pretel (Metro State Aid Construction), Mike Flaagan (Pennington County), Tim Worke (AGC), Kaye Bieniek (Olmsted County), Bruce Firkins (BMI), Tom Ravn (MnDOT Innovative Contracting), Kevin Kosobud (MnDOT Innovative Contracting), Rollin Larson State Aid D6-8 Construction), Ken DeCramer (MnDOT District 6), John Garrity (MnDOT Bituminous Engineer)



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Date: April 5, 2018

Prepared for: Nicole Buehne

Prepared by: Sheila Hatchell

Resources searched: TRID, RiP, Internet, Library Catalog

Summary: This search was limited to the years 2013-2018, as requested by Nicole. *Please note that the titles are hyperlinked to the full document.* The articles I have included are about specific uses of incentives. I was able to find no references that exactly address the question, “Are Construction Incentives Working?” A search of the Internet revealed nothing related to engineering construction projects. All the articles were related to the use of energy conservation to lower costs.

1. Synthesis of Information Related to Highway Problems. Topic 47-09. Effective Practices for Establishing Contract Completion Dates for Highway Projects

Sponsored by: FHWA.

Abstract: State Departments of Transportation (DOT) use various methods to set contract completion dates for highway projects. The objective of this synthesis is to document the methodologies used by DOTs to determine completion dates for different types of contracts. Information gathered for the synthesis will include the following: ... 4) DOT experience with Incentives/Disincentives or Disincentives Only; ... Information for this study will be gathered through literature review, a survey of state DOTs, and follow-up interviews with agencies for case examples of their practices.

2. Design-Build Stipends and Their Impact on Highway Project Innovation

Source: Transportation Research Board, 2018

Abstract: This paper investigates four aspects of stipends: (1) stipend value and calculation processes; (2) impact on a contractor’s decision to propose; (3) impact of stipend amount on an offeror’s proposal development, and (4) stipends’ ability to aid agencies in achieving best value for highway construction projects. All sources agree that stipends are a necessary process to achieve best value as they increase competition and often can increase the quality of a proposal based on the stipend amount. Stipends typically cover one-third to one-half of a contractor’s proposal costs.

3. Quantifying the Impact of I/D Contracting on the Time/Cost Trade-Off for Pavement Rehabilitation Projects

Source: American Society of Civil Engineers, 2016

Abstract: Therefore, alternative contracting methods that are aimed at reducing highway projects’ durations, such as the incentive/disincentive (I/D) method, are gaining popularity among SHAs (State Highway Agencies). For instance, the value of the ID assigned in a highway project has a significant effect on expediting the completion of the project while saving tax dollars. However, the current practice of estimating and assigning the ID value is not adequate and is frequently either overestimated or underestimated. This paper presents the development of a new model to accurately estimate ID value in highway rehabilitation projects based on the desired level of duration reduction.

4. Impact of I/D Contracts Used for Expediting Michigan’s Road Construction

Source: Michigan DOT, 2015

Abstract: The Michigan DOT (MDOT) has been using monetary incentive/disincentive (I/D) payments/penalties to accelerate highway construction work. This paper examines whether the I/D for expediting construction captures the true cost (user delay savings versus actual I/D dollars) and identifies its impacts on the long-term pavement performance for projects that have been expedited. Data were collected and analyzed on projects built through acceleration techniques and similar projects, constructed under standard contract means from 1998 to 2012. The analyzed data statistically supports an improvement in the long-term project performance for incentive projects



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and suggests a trend that incentive clauses accelerate project schedules. Additionally, data analysis statistically supports the concept that incentive clauses increase project cost yet further analysis finds that the avoided user delay was higher than the additional paid cost for some incentive clauses.

5. **Decision-Support Framework for Quantifying the Most Economical Incentive/Disincentive Dollar Amounts for Critical Highway Pavement Rehabilitation Projects**

Source: Texas A&M, 2013

Abstract: One innovative way of reducing construction duration is to reward contractors with an early completion incentive bonus and levy fines for delays. Although use of Incentive/Disincentive (I/D) is increasingly common, State Transportation Agencies (STAs) often struggle to select the most appropriate I/D rates due largely to the lack of proper analytical methods. There is an immediate need to develop a holistic framework that is more general and applicable to a variety of transportation projects for the determination of optimal I/D rates. The main objectives of this study are to create a new decision-support analytical framework of optimal I/D and test whether it can reasonably and realistically determine and justify the most economical I/D dollar amounts.