
**Selection and Evaluation of
Alternative Contracting Methods
to Accelerate Project Completion
(NCHRP 20-5)**

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Selection and Evaluation of Alternative Contracting Methods to
Alternative Contracting Methods to Accelerate Project Completion

INTRODUCTION

- **Study Objectives**

- **Identify**

- Driving factors for the selection of specific ACM
- Advantages and disadvantages of ACM
- Implementation problems and lessons learned

- **Assess**

- Possible impact on performance measures (cost, schedule, quality)
- Application of systematic processes in the selection and evaluation of ACM

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INTRODUCTION

- **Study Methodology**
 - Selected 17 related methods from “Primer on Contracting”
 - Performed literature review on selected methods (TRIS, TRR, AASHTO, ASCE, FHWA, etc.)
 - Developed an electronic survey to include both quantitative and qualitative questions

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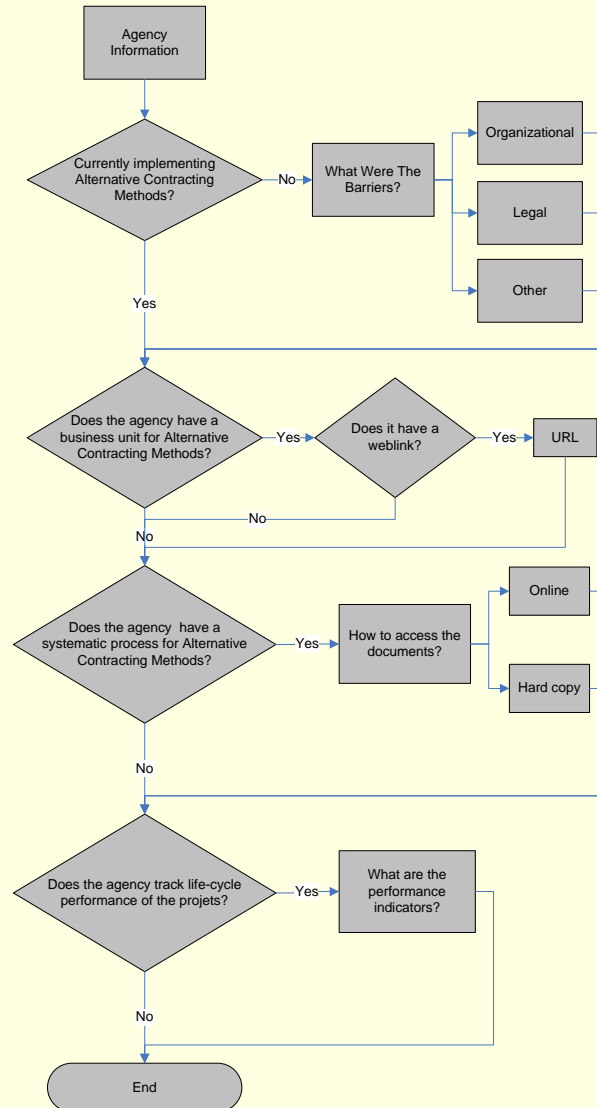
INTRODUCTION

Recommended by Authors			Recommended by Panel	Indicated by STAs
Direct Impact	Indirect Impact	May Impact		
Cost-Plus-Time bidding	Active Management Payment	Design-Build-Maintain	Contractor Overhead Costs (COC)	Design-Sequencing
Design-Build (Include DBW)	Construction Manager at Risk	Early Contractor Involvement	Alliancing	Lump Sum Bidding
Incentives/Disincentives	Flexible Notice to Proceed	Public Private Partnerships		Liquidated Savings
Interim Completion Dates	Quality Factors			
Lane Rental				
Multi-Parameter bidding				
No Excuse Incentives				

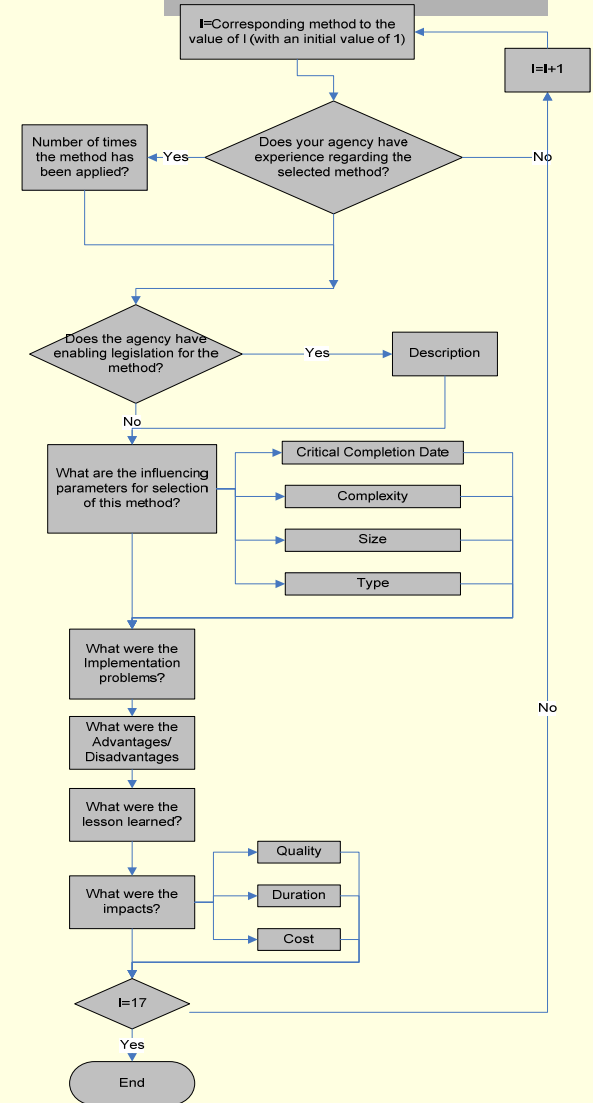
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INTRODUCTION

General Approach



Method Related



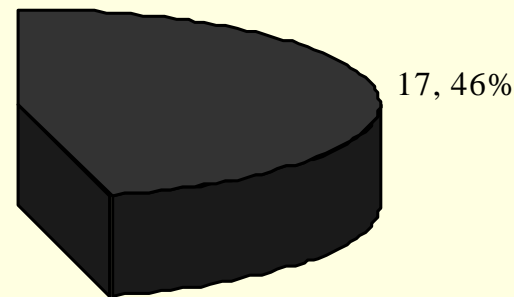
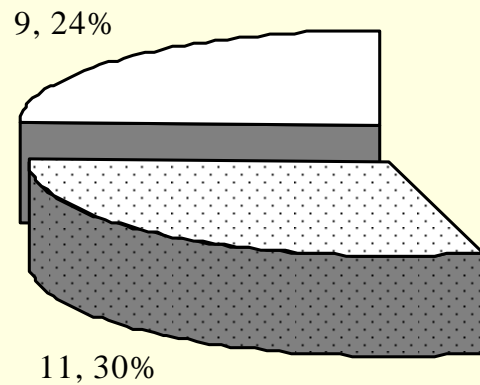
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INTRODUCTION

- **Analysis Focus**
 - *Use and Frequency of Implementation*
 - *Selection Factors*
 - *Impact on Performance Measures*
 - *Implementation Issues*

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■ **ACM Organizational Issues**



- Lack of Prior Expertise
- ▣ Lack of Enabling Legislation
- Other

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OVERVIEW OF ACM

■ **ACM Organizational Issues - Other**

Barriers	Frequency
Shortage of qualified personnel and organizational structure	3
Lack of adequate funding	2
Adherence and familiarity with known and proven methods	1
Employee union opposition	1
Inexperience of contracting community	1
Lack of demand considering the type of projects	1
Lack of leadership for innovative actions	1
Size of contracts	1

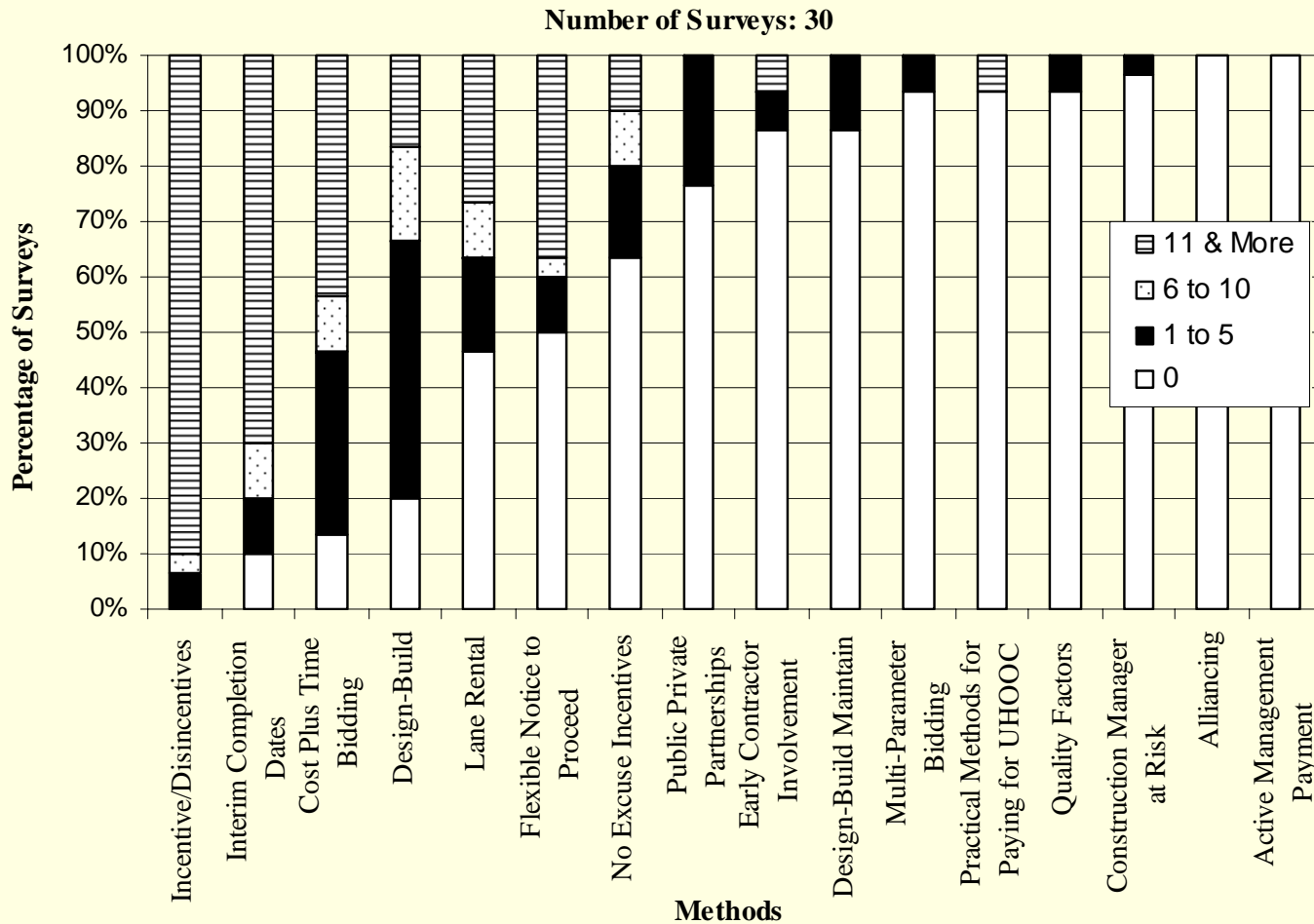
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OVERVIEW OF ACM

- **Application of ACM**
 - Methods with *High Implementation*
(16 or more STAs use this method)
 - Methods with *Medium Implementation*
(6 to 15 STAs use this method)
 - Methods with *Low Implementation*
(1 to 5 STAs use this method)
 - Methods Not Used

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Frequency of Application of ACM



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OVERVIEW OF ACM

■ **ACM by Level of Use**

High Use	Medium Use	Low Use	No Use
Incentives/Disincentives	Flexible Notice to Proceed	Early Contractor Involvement	Alliancing
Interim Completion Dates	No Excuse Incentives	Design-Build Maintain	Active Management Payment
Cost Plus Time Bidding	Public Private Partnerships	Multi-Parameter Bidding	
Design-Build		Contractor Overhead Costs (COC)	
Lane Rental		Quality Factors	
		Construction Manager at Risk	
		Lump Sum	
		Design Sequencing	
		Liquidated Savings	

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EVALUATION OF ACM

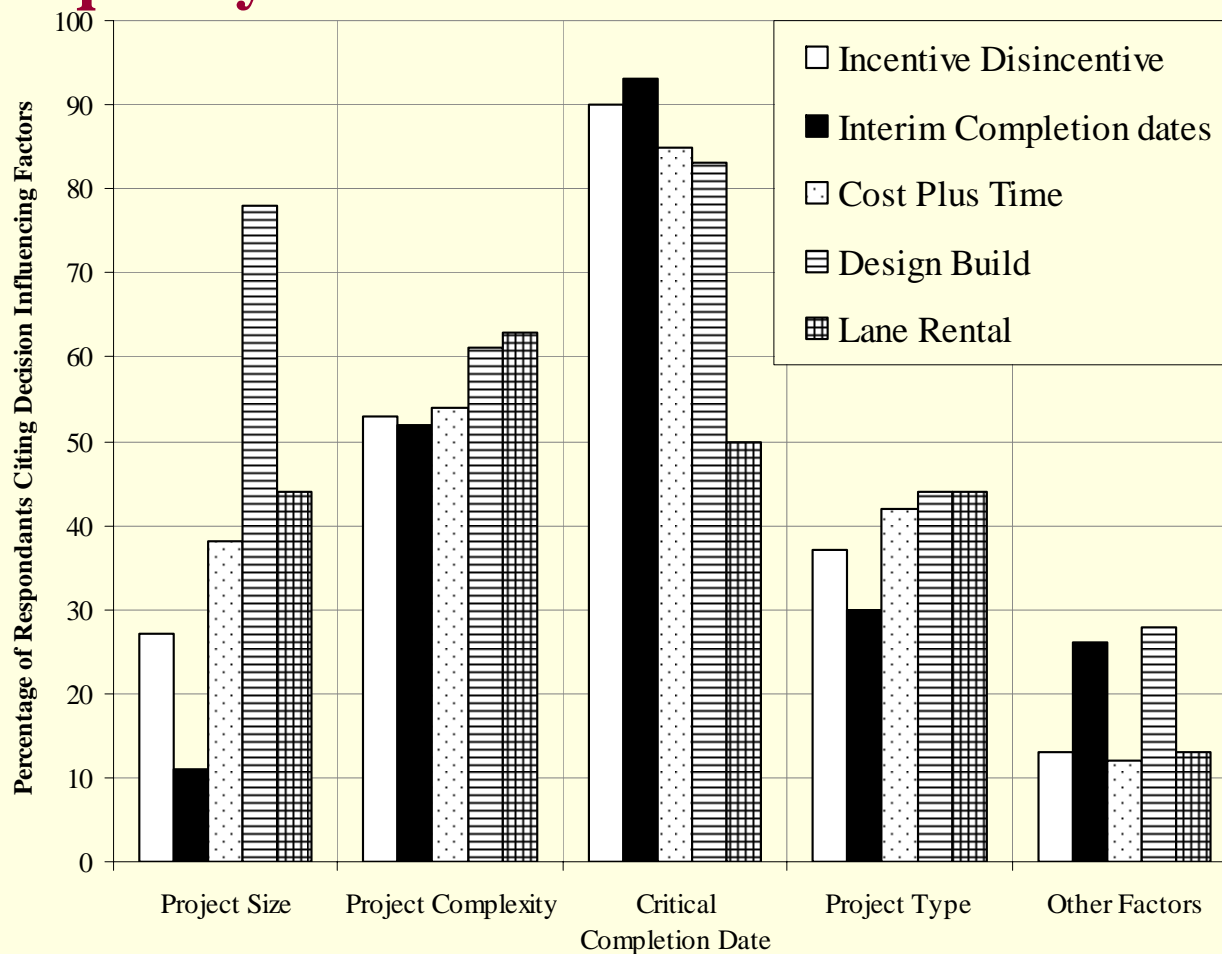
■ **Influencing Factors for Selecting ACMs**

- **Project size** – assessed in terms of the estimated cost of a project in dollars
- **Project type** – assessed in terms of preservation, rehabilitation, reconstruction projects and new construction
- **Project complexity** – typically assessed in terms of project location and other sources of complexity such as combination of pavement and structures construction, utility conflicts, significant traffic control requirements, etc.
- **Critical completion date**

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EVALUATION OF ACM

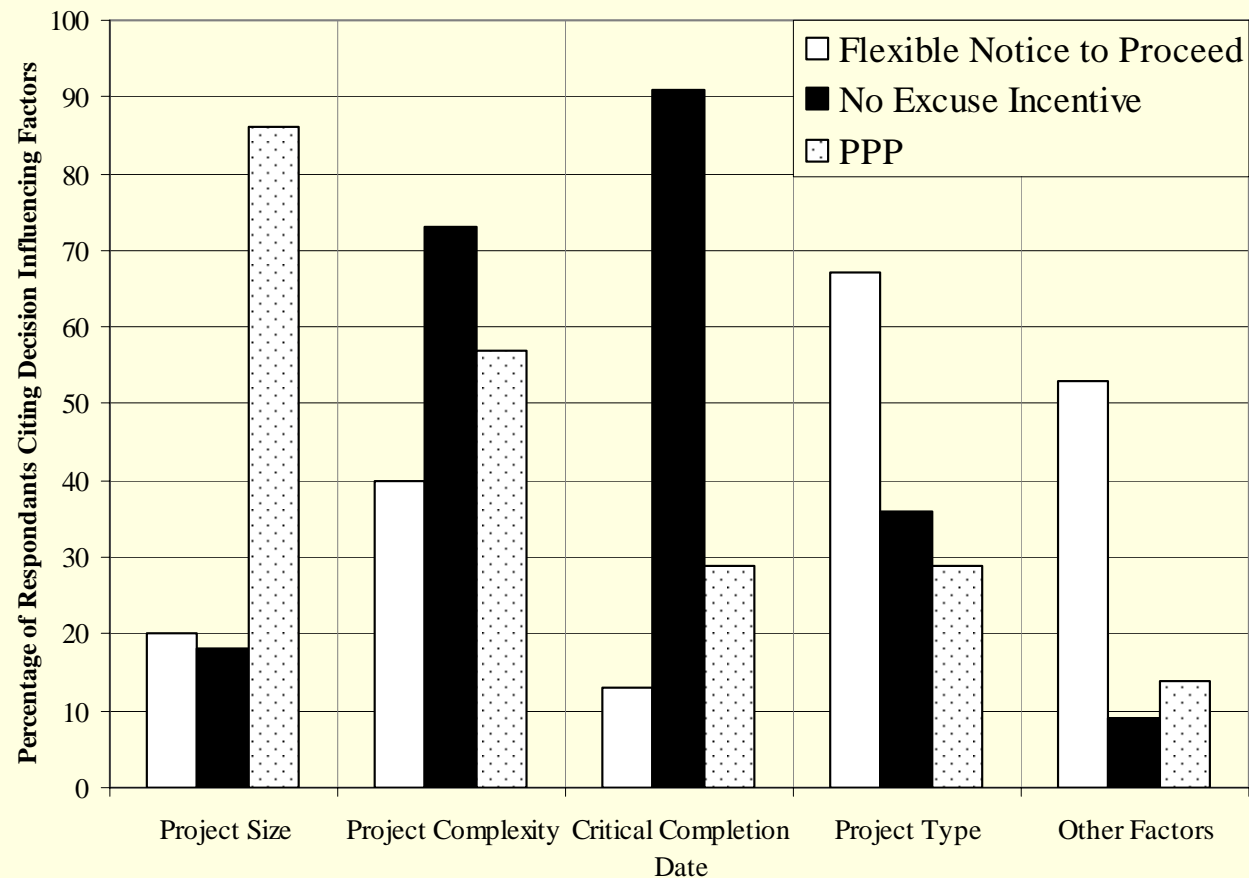
■ **Methods with High Implementation Frequency**



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EVALUATION OF ACM

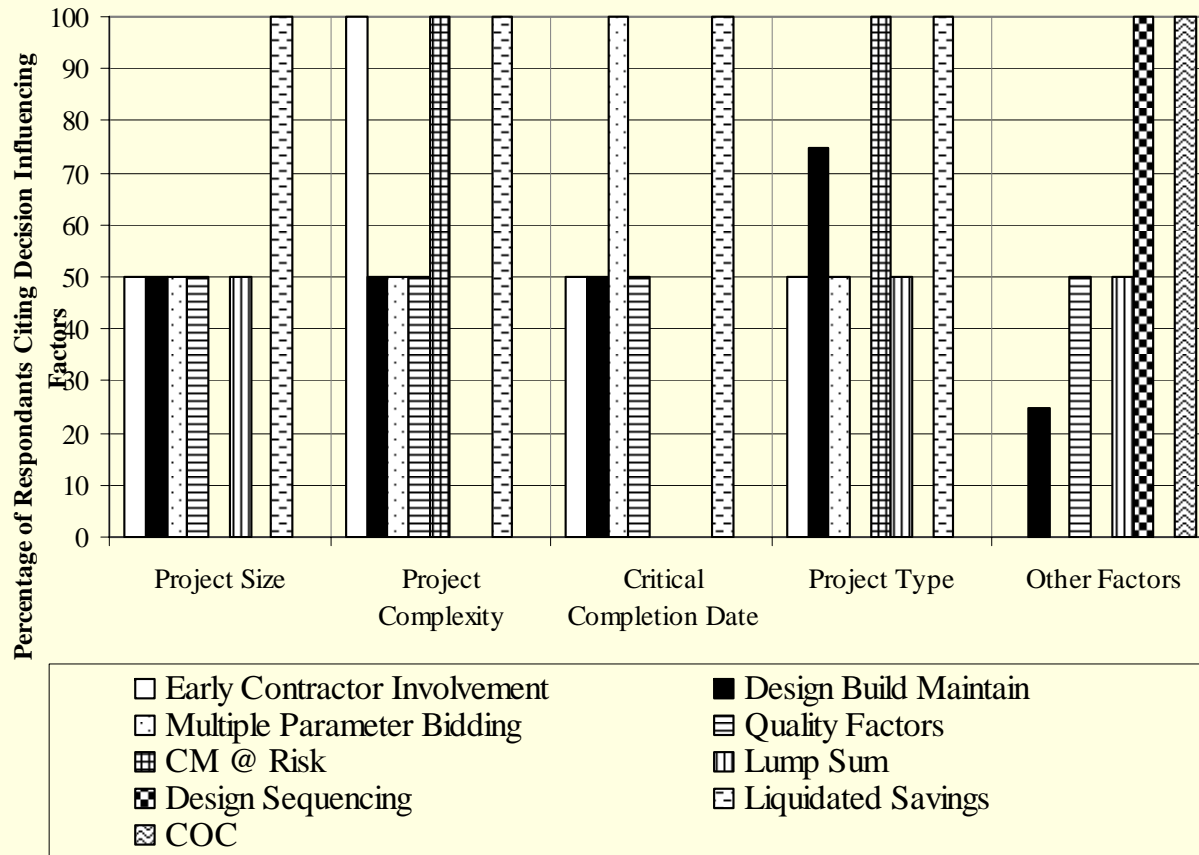
Methods with Medium Implementation Frequency



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EVALUATION OF ACM

■ Methods with Low Implementation Frequency



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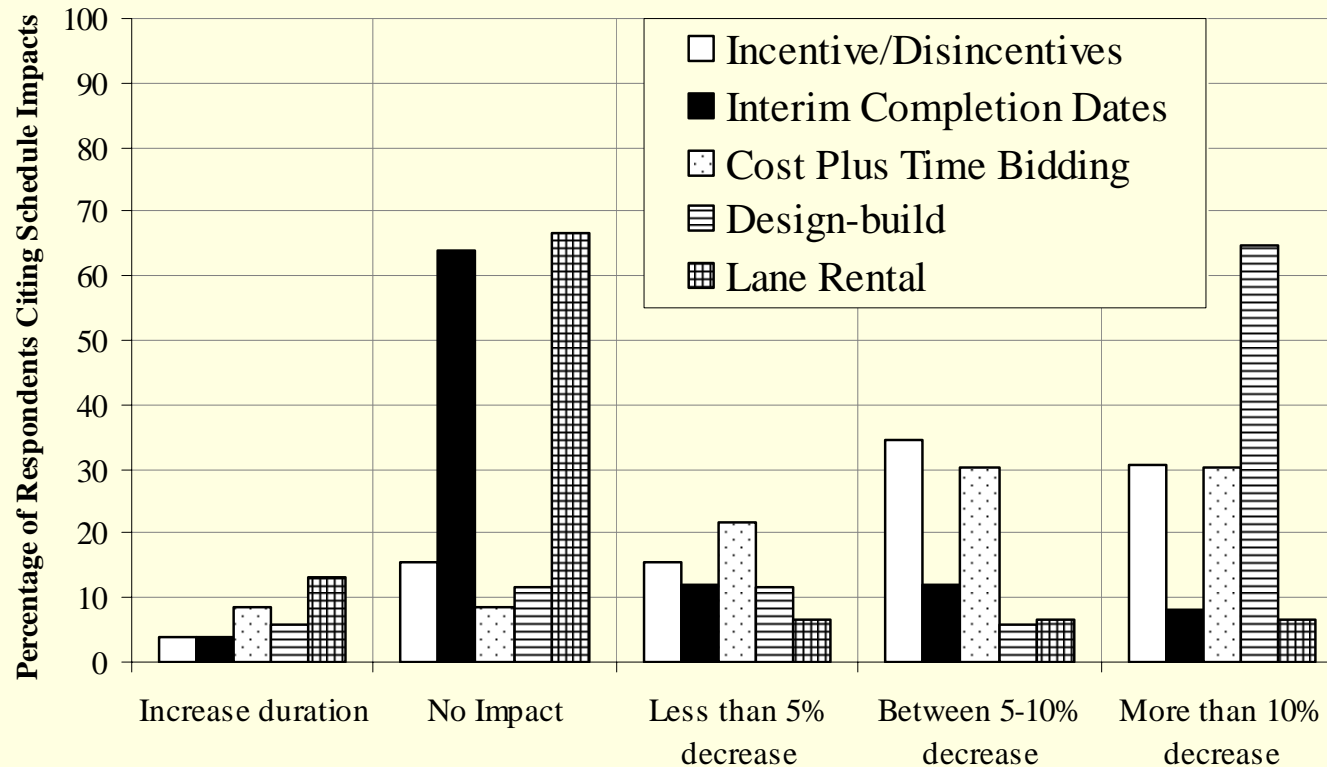
EVALUATION OF ACM

- **Performance**
 - **Schedule** – Measured by assessing the average reduction in project duration (relative to estimated or projected duration)
 - **Cost** – Measured by assessing percent under or over the anticipated total project budget
 - **Quality** – Measured by assessing whether quality was lower, the same or better when compared to a typical project that did not implement ACM

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EVALUATION OF ACM

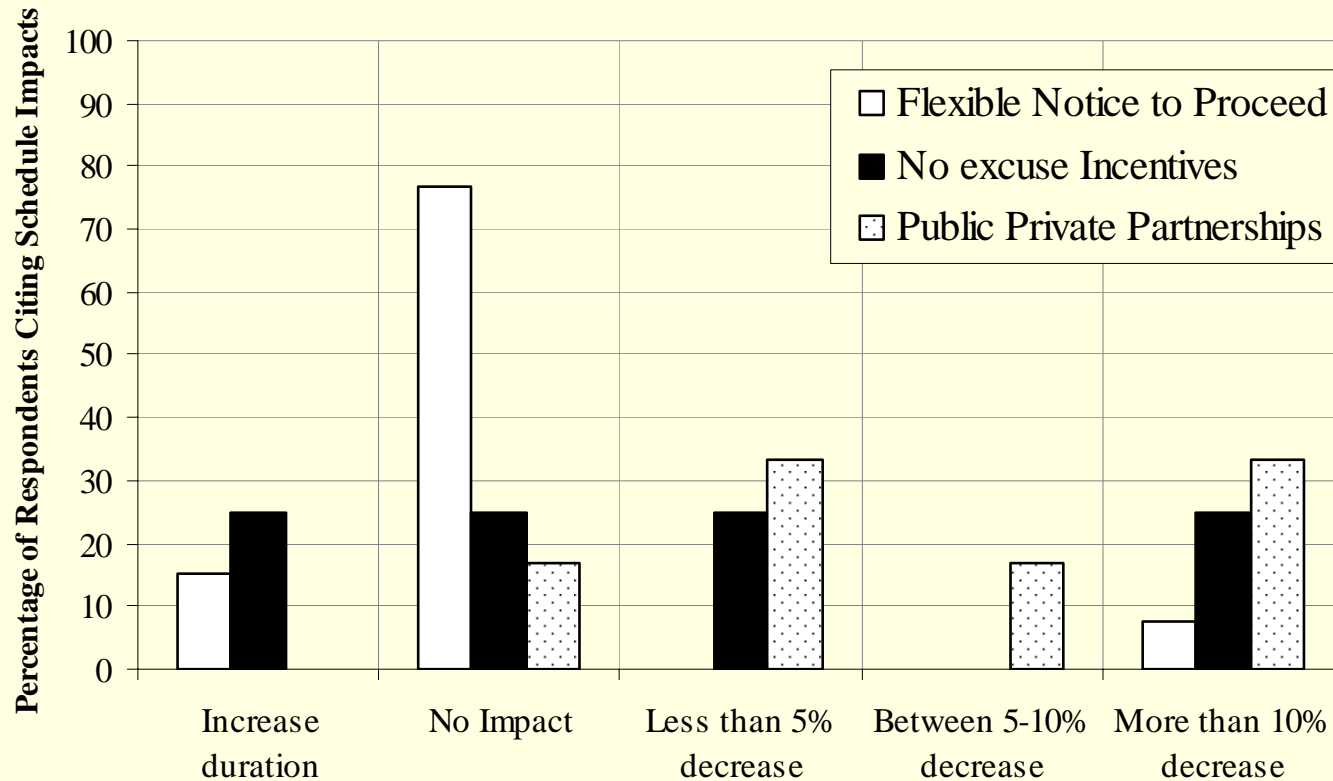
■ Schedule Performance - Methods with High Implementation Frequency



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EVALUATION OF ACM

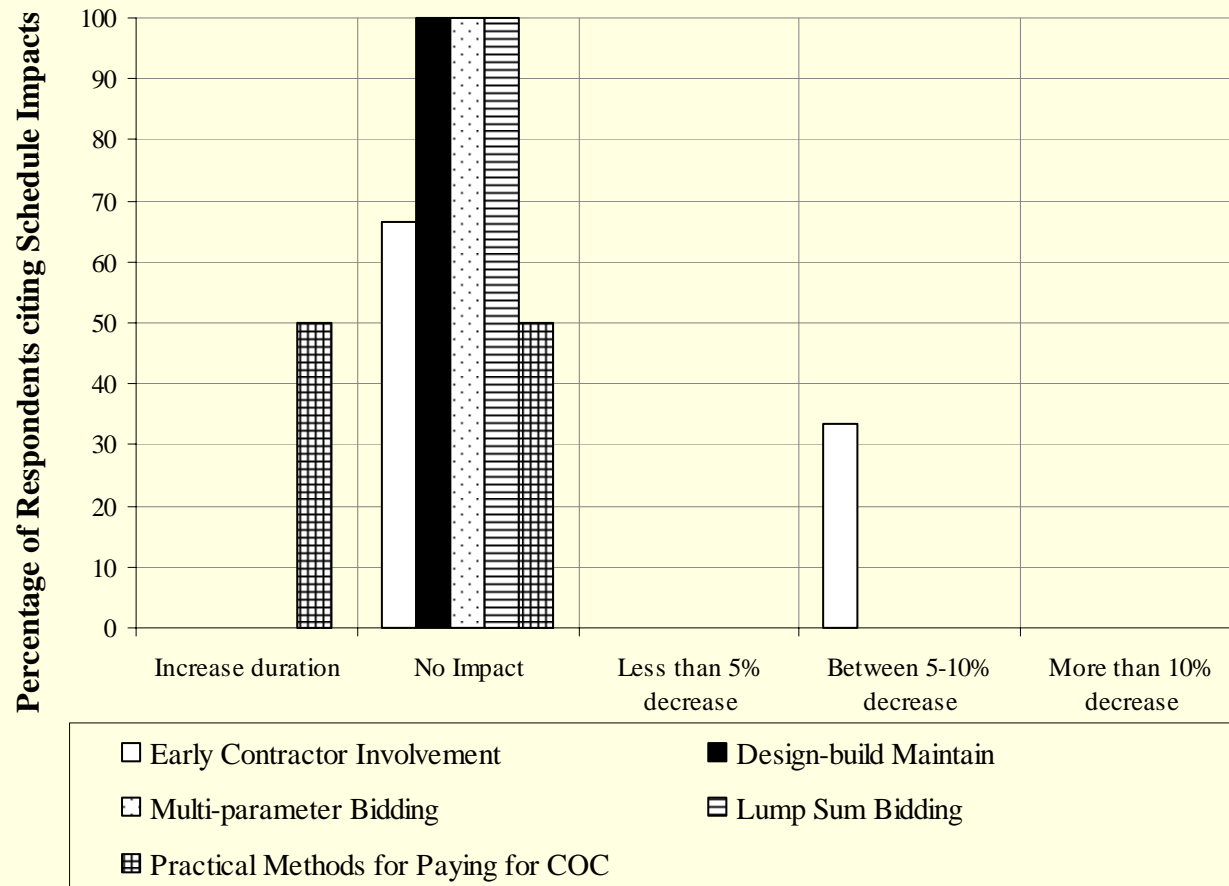
■ **Schedule Performance - Methods with Medium Implementation Frequency**



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EVALUATION OF ACM

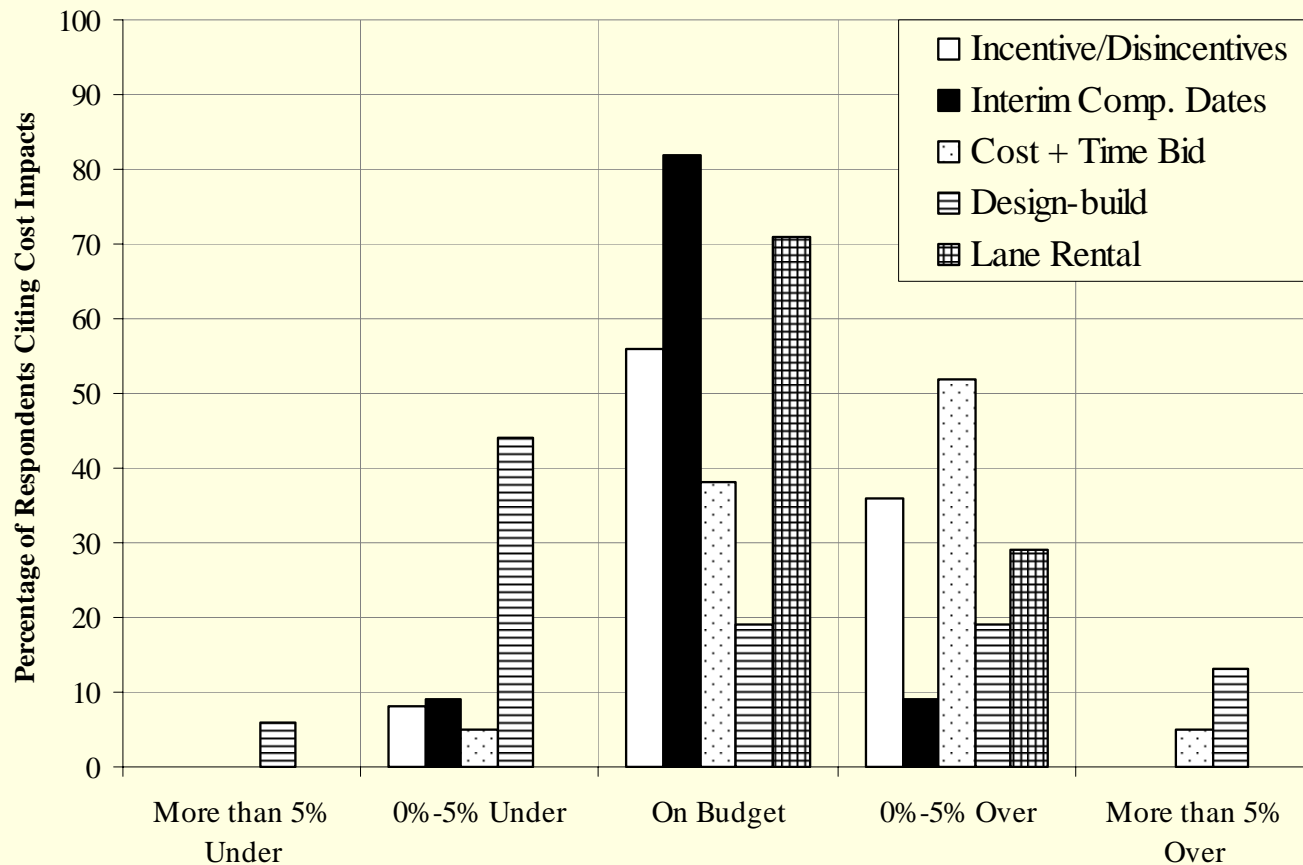
■ Schedule Performance - Methods with Low Implementation Frequency



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EVALUATION OF ACM

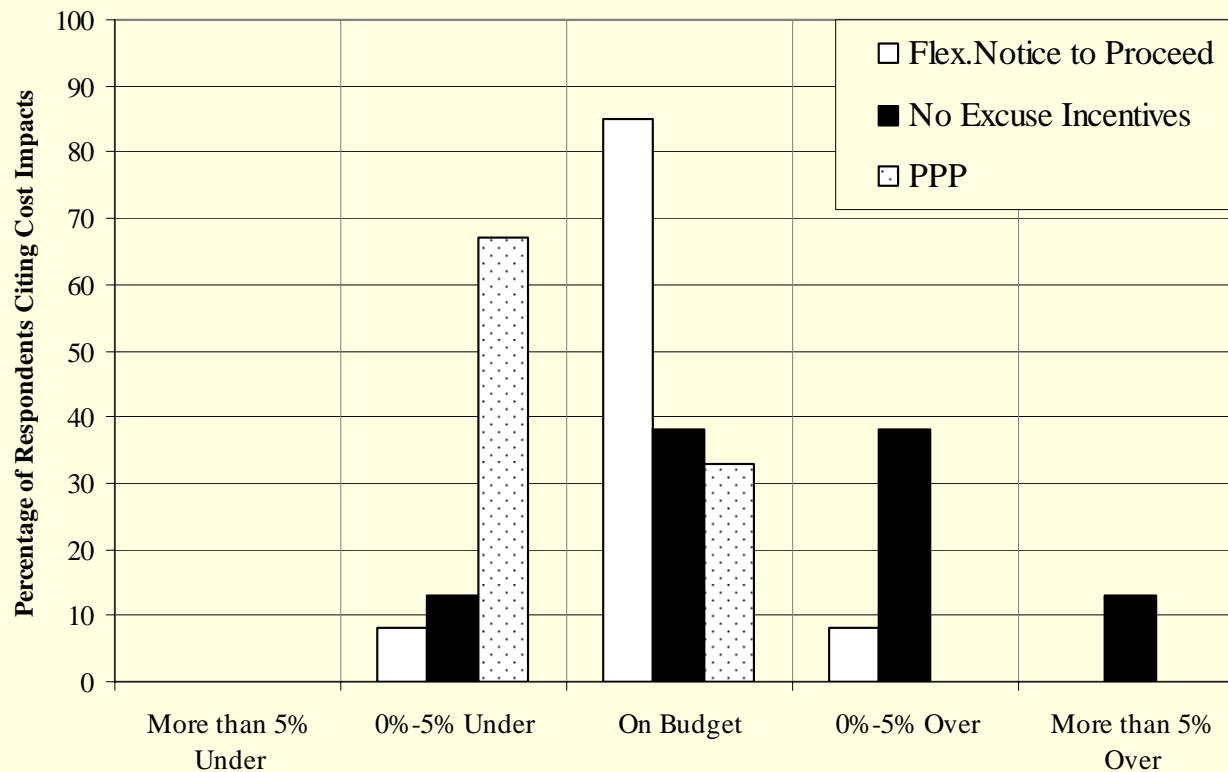
■ Cost Performance - Methods with High Implementation Frequency



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EVALUATION OF ACM

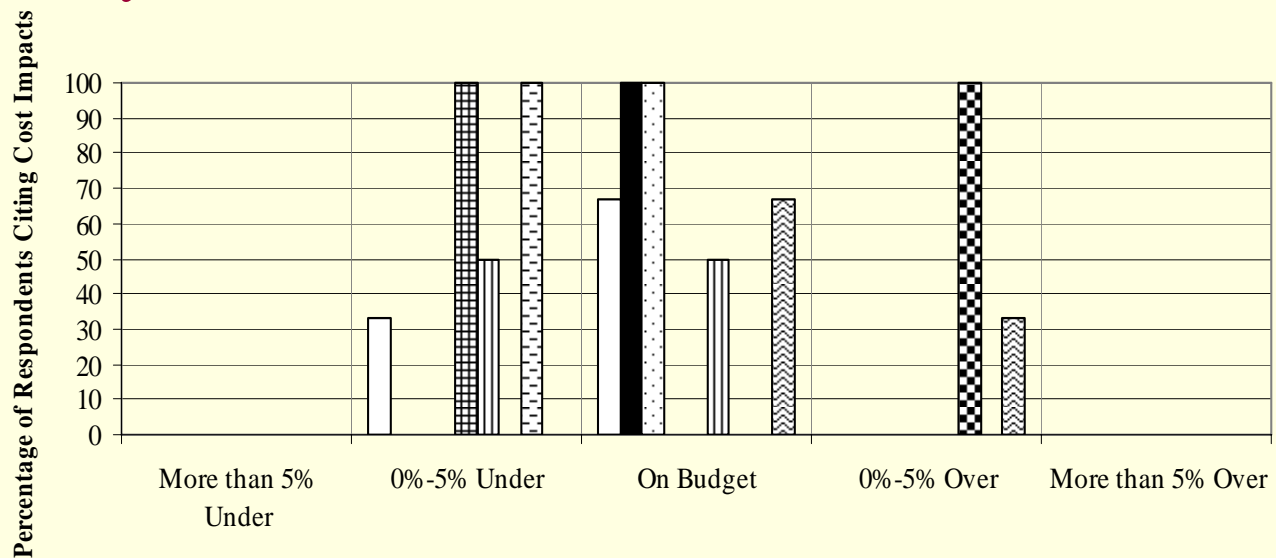
■ **Cost Performance - Methods with Medium Implementation Frequency**



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EVALUATION OF ACM

■ Cost Performance - Methods with Low Implementation Frequency



- Early Con. Involvement
- Design-build Maintain
- ▣ Multi-parameter Bid
- ▤ Quality Factors
- ▥ CM at Risk
- ▦ Lump Sum Bidding
- ▧ Design Sequencing
- ▨ Liquidated Savings
- ▩ Prac. Meth. for COC

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- **Quality Performance**
 - It is perceived that ACM does not impact the quality
 - This result seems to contradict the perception that accelerating project completion negatively impacts quality.

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EVALUATION OF ACM

Implementation Issues

Incentive/Disincentive	<ul style="list-style-type: none">■ Problem in handling Delays caused by unforeseen circumstances■ Not to be used for projects that are likely to have additional work■ Need for a realistic and detailed schedule
Interim Completion Dates	<ul style="list-style-type: none">■ Disagreement over delays■ Missed milestones due to weather■ Right of way issues■ Difficulty regarding coordination between related projects
Lane Rental	<ul style="list-style-type: none">■ Difficulty with monitoring contractor progress for works done at night■ Difficulty in trying to predict the contractor's schedule and procedures■ The common cost problem encountered was in calculating the delay cost incurred by road users

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EVALUATION OF ACM

■ **Implementation Issues (Cnt'd)**

Cost Plus Time Bidding	<ul style="list-style-type: none">■ Lack of bids■ Problems in resolving delays and charging disincentives■ Problems regarding accurately defining costs■ Difficulty in determining the road user costs and value of reducing delay time■ Needs well written contract documents
Design Build	<ul style="list-style-type: none">■ Implementing is hampered mainly by legislation and problems developing and administering the DB contract■ Difficulties in providing a clear project scope for potential bidders■ Lack of experience■ Difficulty in pricing the risk to the design-build contractor■ Difficulty in defining the scope

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■ **Implementation Issues (Cnt'd)**

Flexible Notice to Proceed	<ul style="list-style-type: none"> ■ Difficulty in anticipating when field personnel resources will be needed by the STA
No Excuse Incentive	<ul style="list-style-type: none"> ■ Delay related issues ■ Needs clear contract's language in defining "No Excuse"
Public Private Partnerships	<ul style="list-style-type: none"> ■ Difficulty in obtaining multiple proposers ■ Another difficulty cited with using PPPs is the use of "non-compete" clauses that are necessary to protect the franchisee's investment ■ Need for clarification regarding the buyout provisions at the beginning of the agreement
Early Contractor Involvement	<ul style="list-style-type: none"> ■ Difficulties in gaining effective contractor input at an early stage in the design process ■ Further, there were some legal concerns with ensuring contractors had not obtained an advantage through their early participation in the project

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SYSTEMATIC SELECTION PROCESSES

- **States with Systematic Processes**
 - *Minnesota*
 - *Utah*
 - *Ohio*
 - *California*
 - *Pennsylvania*

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CONCLUSION

■ **General Conclusions**

- Specific units for implementation of ACM in some states
- Legal issues still remains a barrier to implementation especially with Design-Build
- There is often shortage of qualified personnel and organizational structure to support alternative contracting
- Some agencies no longer use certain methods such as cost plus time and lane rental
- Very few systematic selection processes are used to guide the implementation of ACM

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CONCLUSION

- **General Conclusions (Cnt'd)**
 - Every contracting method has its advantages and disadvantages so care must be taken when selecting it for project acceleration in a particular project
 - Project acceleration is influenced by other issues beyond selecting the appropriate contracting method

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CONCLUSION

- **Specific Conclusions – Methods with High Implementation Frequency**
 - Selection of these methods is driven primarily by the requirement to meet a critical completion date
 - All five methods reduce schedule duration and three reportedly reduce duration for approx. ten percent.
 - Project complexity and type are the important critical factors.
 - Cost performance for all five methods generally varies between five percent under and five percent over budget.
 - Quality is generally perceived as being unaffected

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RECOMMENDATION

- **Recommendations**
 - STAs may consider establishing a business unit
 - STAs could consider the development and use of a systematic process as a decision support tool to aid in the method selection
 - STAs can be encouraged to document implementation results and perform an analysis of the results to more specifically identify the benefits

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Thanks