FINAL REPORT

ALTERNATIVE CONTRACTING RESEARCH

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Disclaimer

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation.

Metric Conversion Table

SI* (MODERN METRIC) CONVERSION FACTORS				
APPROXIMATE CONVERSIONS TO SI UNITS				
Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
NOTE: volumes greater than 1000 L shall be shown in m^3				
		MASS		
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
APPROXIMATE CONVERSIONS FROM SI UNITS				
Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T

*SI is the symbol for the International System of Units. Appropriate rounding shall be made to comply with Section 4 of ASTM E380.

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16. Abstract

Alternative contracting methods have become popular alternatives to the traditional practice whose emphasis is on low bid acquisition. The benefits of decreased project schedule, increased job quality, and improved delivery process have demonstrated their value to the public over the years with the implementation of such methods as A+B, Design Build, Incentive/Disincentive, No Excuse Bonus, and Lump Sum contracting. In their continued efforts to gauge the performance of their Alternative Contracting Program in the administration of highway construction projects, the Florida Department of Transportation (FDOT) sought to evaluate the effectiveness of these methods in comparison to Design Bid Build. The research team first examined literature and surveyed past project participants on common practice. Next, interviews were conducted to garner further insight on method-specific performance and general sentiment. Lastly, thousands of completed projects were analyzed and compared to traditional projects for cost, schedule, and quality performance. To assess the effective administration of alternative contracting methods, this report provides the final results of the surveys, interviews, data analyses, method reviews, and recommendations. With all methods providing time savings and added quality, cost savings was the main consideration in performance evaluations.

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Executive Summary

The purpose of this research project was to evaluate the Alternative Contracting Program as currently practiced by the Florida Department of Transportation (FDOT) in the administration of construction projects. As an alternative to the traditional low-bid Design Bid Build process typical in the department, the following contracting methods have been utilized in executing highway construction jobs:

- A+B Bidding
- Lump Sum Contracting
- No Excuse Bonus
- Incentive/Disincentive
- Design Build

To assess the value of each alternative contracting method, in comparison to Design Bid Build with regard to cost, time, and quality, the research team was asked to distribute surveys and conduct interviews on qualified individuals, and analyze the performance of previously completed projects.

As the first analytical tool in evaluating the FDOT's Alternative Contracting Program, the survey instrument was designed to investigate literature on each of the contracting methods and compare these prevalent views and generalizations with common practice. The survey also explored the participants' attitudes, and obtained input on the perceived significant advantages and disadvantages of each method in question. These participants were selected among those in the highway construction industry with prior involvement with Florida projects, including designers, engineers, contractors, consultants, and inspectors.

First, the research team reviewed published work on the performance of each alternative contracting method as compared to traditional Design Bid Build. Next, overarching themes were compiled, specifically with regard to cost-, time-, and quality-based performance markers. The survey instrument was structured in such a way that the job experience of the participants was assessed – including overall years of involvement within their current firm, exposure to each of the alternative contracting methods in question, and the approximate number of alternative contracting projects on which they have previously worked. For each contracting method, the participants were presented with prevailing views, and then asked if they agreed or disagreed with the statement, or were unable to judge. They were, additionally, provided an opportunity to comment on the specific statements, and asked to list any significant advantages and disadvantages for the contracting methods.

As the second analytical tool in evaluating the five contracting methods comprising the FDOT's Alternative Contracting Program, an interview instrument was developed which further explored prominent issues and sentiments previously elicited from the survey questions, and examined the general concerns expressed by various individuals in the open-ended commentary responses.

Following detailed analysis of the survey instrument, the research team obtained insightful information regarding perceived versus actual practices for each one of the five methods. Individual participant responses to the literature review helped confirm and refute major sentiments, highlighted conflicting issues between project parties, and offered further avenues of investigation via respondent feedback. From this study, the interview instrument was developed to further investigate the following issues: the construction industry's perception on how effectively and efficiently each contracting method is currently operating under the FDOT's direction; issues and concerns that the parties feel should be addressed – whether in the administration, implementation, or direct practice of each method; conflicting sentiment between project parties, and among individual state districts; and overall views on means of improvement.

While these first two tools gathered, interpreted, and evaluated the personal opinions and industry views of willing participants, a third analytical tool was implemented to investigate purely empirical data. In addition to analyzing results from the survey and interview tools, this report provides the results from this third investigation and uses the information to further assess the value of each alternative contracting method, as compared to the traditional Design Bid Build method, with particular regard to the cost, time, and quality performance.

Concerning the cost analysis, breakdowns of the number of projects that experienced either cost overruns or cost savings on the contract amounts were first provided. Similarly, breakdowns of the number of projects that were completed early, on time, and delayed are also offered. Then, following the breakdowns for each cost category, summaries of the cost and time analyses (as broken out by these cost categories) are presented as an overview of performance for the delivery methods. From there, steps were taken to identify potential project outliers and, subsequently, screen out the valid anomalies. In this step, only three projects were deemed true outliers (termed "dataset outliers") and removed from analyses in this report. A few projects were identified as potential outliers purely through statistical methods (termed "statistical outliers"), but were not excluded from the analyses. The corresponding summary tables produced are presented in this report, and the excluded and suspicious outlier projects are also shown for the FDOT's consideration.

Summary of the quality analysis is also presented as an overview of performance for the delivery methods of interest. Investigations were made for all projects previously analyzed for cost and time. Additionally, a second – and more in-depth – analysis on quality performance was made of a subset of the projects. This parsing was performed for the benefit of investigating specific subcategories that were considered more relevant to overall project quality.

Following analysis of the available project data, conclusions were subsequently drawn based on the average time and cost savings, time performance, cost performance, and quality assessment.

Results from the survey section mostly aligned literary thought with current industry practice. All contracting methods were viewed by all participant groups (designers, contractors, and inspectors) as improving the project schedule. However, only designers attributed Lump Sum as improving project quality. Regarding project costs, the views were divided with designers and contractors feeling A+B improved project costs, contractors and inspectors believing Lump Sum improved costs, and all parties agreeing that Design Build improved costs.

Results from the interview section gathered pertinent information from FDOT-specific inquiries, which include the following: special provisions sections were not found to be too vague; the

QC/QA process was not generally influenced by contracting method as it was more governed by contract provisions; the FDOT largely selects projects appropriate for their delivery systems; and bonuses, incentives, and compensations, however, were felt to be inadequate and not worth the increased effort required to attain. Furthermore, most parties requested additional and continued investigation for the Design Build selection, procurement, and compensation process, citing specific issues with the subjectivity of the adjusted scoring process.

Results from the data investigation supported original survey views, noting a minimum average schedule savings of five days for each of the contracting methods, with Incentive/Disincentive, A+B, and No Excuse Bonus showing the most days saved. Conversely, these same three methods showed the least cost savings benefit, with all three actually incurring additional costs for the sake of the increased time savings. Related to cost categories, it was shown that with increased costs, there is generally a decrease in cost savings as well as schedule savings. Quality-wise, investigation of the overall Contractor Past Performance Ratings (CPPR) scores did show that the three previously identified methods (A+B, Incentive/Disincentive, and No Excuse Bonus) generally have higher scores; however, definitive conclusions could not be drawn as not all the methods had sufficient representation scores, nor did they all have category-specific subscores to further investigate quality.

Observed limitations were purely within the scope of participant sample size, with limited numbers to perform statistical analysis. This was prevalent among the actual number of completed projects from which data was obtained as well as among the number of participants partaking in the surveys and interviews.

In conclusion, the interpreted value provided by the five alternative contracting methods, in terms of both cost and time savings, supports their continued use and benefit as compared to the traditional Design Bid Build method. Project-specific demands such as schedule constraints often require parties to consider the most beneficial contracting method for the situation at hand. Whether an early consideration of the project schedule (such as is warranted by A+B), or the strict adherence of a deadline (specific to No Excuse Bonus), or the flexibility of overlapping construction phases (particular to Design Build), the selection of an alternative contracting method requires deliberate evaluation of the pros and cons. Tailoring each project to its specific demands benefits not only the department with its effective use of resources, but also the general public and project contractors with efficient improvements to our infrastructure.

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Chapter 1: Introduction

Background

In the realm of highway project administration, alternative contracting methods provide suitable alternatives to the traditional low-bid style. Alternative contracting methods have also become popular alternatives to the traditional Design Bid Build practice. The benefits of decreased project schedule, increased job quality, and improved delivery process have demonstrated their value to the public over the years, and in their endeavors to provide this added level of quality, the Florida Department of Transportation (FDOT) aims to reassess their current practice.

The FDOT has consistently remained abreast of innovative contracting techniques and alternative practices. Over the past few decades, the FDOT has taken measures to evaluate and assess a growing number of techniques in order to improve the delivery of highway construction projects. And as early as 1991, with Ellis et al. researching the FDOT's Design-Build pilot program, the University of Florida has been aiding the FDOT in studying the benefits of alternative contracting methods.

In re-evaluating the current Alternative Contracting Program, all avenues of practice and project administration must be exhausted. To do so requires investigation as to the current practice, thoughts, and sentiments of professionals in the industry, the opinions of those currently employing the methods in question, and the insight from empirical inquiry and evaluation.

Objectives

The objectives of this research project were to:

(1) objectively and accurately evaluate the FDOT's Alternative Contracting Program based on past project performance;
(2) provide recommendations for the improvement of the FDOT's Alternative Contracting Program.

Focusing on A+B Bidding, Lump Sum Contracting, No Excuse Bonus, Incentive/Disincentive, and Design Build, efforts were directed towards evaluating the performance of each method as compared to the traditional Design Bid Build practice.

Cost and time savings, as well as quality performance, were of utmost importance, followed by each method's perceived effects on project specifications, quality concerns, method selection and use, project procurement, and bidder compensation. The targeted population comprised individuals having had direct involvement with any or all of these alternative contracting methods, including designers, engineers, contractors, consultants, inspectors, and other FDOT personnel.

The tasks associated with completion of the objectives were as follows:

(1) develop survey instrument;
(2) conduct survey, summarize responses, and analyze results;

(3) develop and conduct interviews, summarize responses, and analyze results;
(4) collect and analyze project performance data; and
(5) produce draft and final reports.

Kickoff, closeout, and intermediary teleconference meetings were conducted throughout the duration of the project to review performance and progress, solicit feedback, and resolve inquiries.

Chapter 2: Literature Review

Review of Previous Research

While "low bid" has remained the prevailing practice for several state DOTs in awarding contracts, several agencies have recognized the growing importance of other project factors, including delivery time, life-cycle costs, quality, and safety. As such, the Federal Highway Administration (FHWA) has permitted state DOTs to evaluate the use of non-traditional contracting methods on federal highway projects through the Special Experimental Projects 14 (SEP-14) Program (FHWA, 2014a). As early as 1990, this program permitted DOTs to use project-specific contracting practices that would reduce life cycle costs while simultaneously preserving project quality. Since its inception, four specific practices (cost-plus-time bidding, Design-Build contracting, lane rental, and warranty clauses) have been deemed acceptable operational techniques and are no longer considered "experimental".

In light of this early movement, the Florida legislation authorized the use of Design-Build for building projects, major bridges, and railway corridors in 1995. The following year, authority was expanded for all projects as part of "innovative" practices. Also, in 1996, the legislation facilitated the use of Alternative Contracting techniques to control cost and schedule growth on construction projects.

More recently, in October of 2010 the Every Day Counts (EDC) initiative was implemented by FHWA to improve project delivery approaches and promote innovative practices in highway construction by reducing construction times, and reducing taxpayer costs, and increasing driver safety (FHWA, 2014b).

A+B Bidding

A+B bidding, oftentimes termed cost-plus-time, is a method of bidding that entails consideration of both project costs and project duration. Contractors submit their bids in two components: (1) "A" comprises the dollar amount for work performed; and (2) "B" covers the total calendar days required to complete the job, multiplied by an associated cost of the time, deriving a monetary value for time. This method of bid determination provides a more encompassing valuation of the project than traditional low-bid submissions. Having to account for project duration, contractors can modify specific processes in order to optimize construction speed. It is important to note, however, that this value is used solely for bidding and is not used in contractor payment.

Per the FHWA, the formula for this bidding method is (FHWA, 2014a):

$$\text{Total Bid} = (A) + (B \times \text{Road User Cost / Day})$$

A is the summation of all contract items multiplied by their respective contractor-derived unit prices. B is the number of calendar days, which is then multiplied by a user cost per day. This user cost per day value is pre-established by FDOT prior to project advertising (FDOT, 2014a). Road user costs are used to discourage contractors from running up the time submission; incentives are usually awarded for completing the project ahead of schedule, and disincentives and liquidated damages are typically assessed per contract stipulations. The contract time is adjusted for extra work, unforeseen conditions, and weather.

FHWA has reportedly shown that the use of A+B produces notable results including reduced contract times, acceptable costs, and maintained quality (FHWA 2014a). Furthermore, for projects with the potential to have high delay impacts, this method can significantly reduce these impacts (FHWA, 2014a).

When the FHWA recommended state DOTs investigate bidding methods (including A+B) in 1991, the technique had previously been used by the U.S. Army Corps of Engineers as "bidding on cost time" (Herbsman, 1988). In response to the pervasive construction in highly trafficked urban areas, in 1992 the Transportation Research Board was prompted to recommend the FHWA study techniques that reduce construction time (TRB, 1991).

Herbsman (1995) compared A+B projects with those bid conventionally (cost-only) showing substantial savings in the former bidding method. Additional conclusions included:

- Most contractors completed the project on time or ahead of schedule
- Bridge work was the most popular type of project
- Reduction of time was achieved with no addition to cost when compared to similar projects bid conventionally
- A+B plus Incentives/Disincentives (I/D) were popular with states that use A+B
- When contractors are motivated to work fast they have more accurate scheduling, more efficient project management, and better resource management

In 2007, Ellis et al. performed further research with FDOT use of alternative contracting techniques. Agency personnel also supported the use of A+B contracts with I/D provisions; and inclement weather, particular to Florida, can have influence on these contracts (Ellis et al., 2007).

Anderson and Damnjanovic (2008) determined that A+B contracts result in accelerated schedule, although these projects are also more inclined to be higher in cost. Most recently, studies of several California-based transportation projects have recommended the combined use of A+B and I/D in motivating contractors to meet schedule dates (Choi et al., 2012).

New York State Department of Transportation (NYSDOT) communicated their experience with driver impact and A+B contracting and the appropriateness for its use (Kent, 2013). From the workshop, the following features were recommended for when A+B bidding is appropriate:

- In urban areas with high traffic
- Project will fill an existing gap in the highway system
- Reconstruction or rehabilitation on existing area will severely disrupt traffic
- Major bridges are out of service
- Project with lengthy detours of high traffic

<u>Lump Sum Contracting</u>

Lump Sum contracting is a method wherein a contractor is provided bid documents with which to calculate quantities and a lump sum bid (FHWA, 2014a). The lump sum will comprise all labor, material, equipment, overhead, and profit for the job (Gordon, 1994). This technique is geared towards simple projects with well-defined scope with the intended purpose of reducing contract administration costs.

Willoughby (1995) defined the prerequisites for success of any design project under lump sum contract as being experience and confidence; management skill; sound communication; and a comprehensive work plan. Experience allows the contractors to resolve problems from previous lesions learned. The management skill to come up with performance measurement while "bringing planning, scheduling and budgeting to the table is essential." Overall success is dependent on good communication skills in project management. And a comprehensive work plan should include a project description, an organizational chart, a scope of service, a work breakdown structure, and a list of all deliverables with responsibilities.

Ellis et al. (2007) compared Lump Sum to traditional projects and determined that Lump Sum contracting works best on projects that have well-defined risks. They further assessed that project contract administration for this type of project is much easier than with traditional projects and there exists a higher demand on project design quality.

Anderson and Damnjanovic (2008) determined that less time was spent measuring quantities, but they also discovered that contractors might add greater contingency to their bids especially if uncertainty potentially exists in the quantity estimates.

Kaplanogu and Arditi (2009) surveyed the use of pre-project peer review (PPPR) in GMP/lump sum contracts. PPPR is conducted internally by a company in order to reduce its risks associated with delivering projects on-time, under budget, and satisfactory to the clients. Reviewers offer impartial feedback to the project team before a GMP/lump sum contract is committed. This study aimed to mitigate or reduce risks. The results showed PPPR is necessary and critical even though formal PPPR is not commonly practiced. Informal PPPR is preferred over formal PPPR by many companies. Furthermore, companies that do not perform PPPR also considered it essential. According to Kaplanogu and Arditi:

> "A lump sum contract requires a contractor to provide a fixed price to the owner to do all the work required by the agreement. A lump sum contract can only be executed when the scope of the work is clearly defined and understood by all parties. This type of contract offers the owner the best protection."

<u>No Excuse Bonus</u>

Under a No Excuse Bonus method of contracting, a contractor is given a "drop-dead date" by when to complete a phase or project and bonuses are awarded for completing work prior to this date. With the exception of catastrophic events, time extensions are not awarded for unforeseen conditions or weather delays (FHWA, 2014a). There are no disincentives associated with this method other than the typical liquidated damages, and the technique is best suited for projects that must meet a critical date. FHWA approved FDOT's use of No Excuse Bonus on federal projects in 1996.

The purpose of this contracting method is to shorten construction time by motivating the contractor with a substantial bonus. Contractors are encouraged to remain on schedule and improve overall construction productivity (FDOT, 2014c). No Excuse Bonus incentivizes early completion and, consequently, lessens public disturbance.

As contractors typically accelerate construction under a No Excuse Bonus contract, increased involvement is required on the part of several subcontractors and agencies. Utility scheduling is critical, and a heavy demand on Construction Engineering and Inspection (CEI) is essential (FDOT, 2014c). As such, contingency funds are usually established to pay for these increased services. Subsequently, contractors may divide the bonus amongst these subcontracted agencies in order to illicit their support.

Ellis et al. (2007) interviewed several FDOT employees regarding the use of No Excuse Bonuses and many felt the bonus must be substantial enough to justify expending resources in order to finish early. Graduated bonuses were also preferred to all-or-nothing ones, providing the contractor with continual motivation throughout the project duration. From this research, the following features were recommended for when No Excuse Bonus is appropriate:

- Projects with large budgets
- Projects with long durations
- Projects that can be constructed outside hurricane season
- High traffic, high visibility, or emergency situations

As with A+B contracts, Anderson and Damnjanovic (2008) determined that No Excuse Bonus results in faster project completion, but that this may lead to increased costs on the part of the contractor in order to cover unexpected delay risks.

<u>Incentive/Disincentive</u>

Incentive/Disincentive (I/D) contracts entail the use of incentive and disincentive monies. Incentive monies are awarded for early project completion as stipulated in the contract. Likewise, disincentive monies are subtracted for late project completion as stipulated in the contract (FDOT, 2014b).

I/D may be used by itself or can be paired with other alternative contracting techniques including the aforementioned A+B bidding and No Excuse Bonus, as well as with the Design-Build delivery method. Monies are assessed daily, and are established by the agency based on administration costs, inspection costs, and road-user costs. The value of the monies is either linear (having constant daily values) or non-linear (having escalating daily values) (FDOT, 2014b).

This method of contracting is most applicable when an agency is prepared to pay for accelerating work and reducing time, either for the entire project or by means of separate milestones (FDOT, 2014b).

Jaraiedi et al. (1995) developed useful guidelines for the use of I/D provisions in highway construction. They noted the following conditions for when I/D is appropriate:

- Projects that will cause severe economic impact on local businesses
- Projects that impair emergency service access for an area for a prolonged amount of time
- Projects where the safety of road users or construction workers is at risk
- Projects that require lengthy detours on poorly maintained roads
- Projects that severely impact traffic on main arteries

In 1997, Arditi et al. conducted early studies in Illinois and found that the majority of jobs performed with I/D were completed on time or early; however, the number and value of change orders were greater for I/D jobs than non-I/D jobs.

Ellis et al. (2007) determined that I/D techniques work best on projects that are high-volume, large, or interstate. Additionally, FDOT include I/D provisions on all A+B projects. Recent studies conducted in California, support this claim and recommend using I/D simultaneously with A+B bidding (Choi et al., 2012).

Anderson and Damnjanovic (2008) found that I/D promotes faster project completion and may reduce CEI costs due to shorter schedules. However, they noted several disadvantages for the method including increased construction costs and the potential for reduced quality, change orders and utility conflicts. Moreover, their research found that unforeseen conflicts often required timely responses as well as an increased need for field inspections.

Design Build

From the 1930s until the mid-1990s, US highway and bridge construction was contracted and constructed using the Design Bid Build construction project delivery system. This procurement system for highway construction involved the separation of design and construction services. The foundation of this system, is the principle of selecting designers based on qualifications (Brooks Act – Public Law 92-582) and selecting construction contractors based on competitive sealed bids, with award to the lowest responsive and responsible bidder often based on 100% Plans Specifications & Estimates (PS&E). The combination of these two procurement practices has helped solidify the proliferation of Design Bid Build in the public sector. Design Bid Build, also known as the Linear System, and later the Traditional System, served the industry well for all those years (Minchin et al., 2014).

Over the decades, Design Bid Build has provided taxpayers with an adequate, safe and efficient transportation facility at the lowest price that responsible, competitive bidders can offer. For the most part, it has effectively prevented favoritism in spending public funds, and has provided checks and balances through separate contracts with the designer and contractor, while stimulating competition in the private sector. However, this process can foster adversarial relationships among the project parties, limit innovation, result in high cost and time growth, and may not necessarily provide the best value to the owner for all project circumstances or types.

In recent years, this issue has become a more pressing concern for highway agencies, as the deteriorating infrastructure and increasing population have created tremendous pressure to move critical projects quickly from the planning stage, through design and into construction, without a commensurate increase in available funding. Underlying these external budget and time pressures is the basic requirement to maintain quality in all phases of the highway program. Thus, there is a continuing need for highway agencies to review and evaluate alternative procurement and contracting procedures that promote improved efficiency and quality. The wide range of options for project delivery methods that are available today is a relatively recent development for publicly funded highway projects in the United States. Design Bid Build has been the traditional project delivery method in transportation projects until the introduction of Design-Build in the Intermodal Surface Transportation Efficiency Act of 1991. Another step was taken in 1996 when the Federal Acquisition Reform Act explicitly authorized the use of Design-Build for federal projects. After that, the Transportation Equity Act for the 21st Century, Public Law 105-178 (TEA-21) allowed the State DOTs to award Design-Build contracts if the enabling state-level legislation was in force (TEA-21, 1998). Subsequent to the successful experience of using Design-Build in several projects, many states passed new legislation and codes to allow alternative project delivery methods.

Design-Build had been a popular delivery system for commercial building construction for many years. The Intermodal Surface Transportation Efficiency Act, passed by the US Congress in 1991, established, among other things, Special Experimental Projects program 14 (SEP-14). This allowed DOTs that had heretofore been using state funds exclusively to fund fast-track highway and bridge construction to apply for federal funding for the construction of highways and bridges using the Design-Build delivery system (FHWA, 2014a).

In 1999, Sanvido and Konchar performed extensive studies on Design-Build and made a few significant findings. When compared to Design Bid Build, Design-Build surpassed its predecessor in the following ways:

- Unit costs for Design-Build were 6.1% less than Design Bid Build
- Construction speed for Design-Build was 12% faster than Design Bid Build
- Delivery speed for Design-Build was 33% faster than Design Bid Build
- Cost growth for Design-Build was 5.2% less than Design Bid Build
- Schedule growth for Design-Build was 11.4% less than Design Bid Build

The AASHTO Subcommittee on Construction (2006) underlined the flexibility a contractor would have under Design-Build in design and construction. A contracting agency would set (performance-based) end results that would permit bidding parties to optimize their design and construction methods.

Per Ellis et al. (2007), Design-Build proved sensitive to delays and a majority of interviewees cautioned using the delivery system with right-of-way- and utility-laden projects. However, it was noted that Design-Build projects had a better relationship between the contractor and FDOT agency than between the FDOT agency and design professional. Administration for Design-Build, was considered similar to Design Bid Build.

Anderson and Damnjanovic (2008) showed how time savings was the greatest advantage of Design-Build, not only because of an overlap of design and construction but most likely due to the familiarity with the project contractors (as compared to undergoing an open bid process to find a suitable contractor). The research also noted the agency’s loss of design control and the design-builder’s increased risk as disadvantages.

More recently, Minchin et al. (2014) evaluated the use of Design-Build (and Construction Manager/General Contractor) in highway construction and determined that Design-Build is the preferred method for critical delivery and that legislative authority still precludes several agencies from using the method.

Chapter 3: Methodology

Experimental Design

To properly evaluate the FDOT's Alternative Contracting Program, project activities were generated to facilitate and implement the previously outlined research tasks. Figure 3-1 illustrates the sequential nature of these activities, categorized as either an established Project Task or a supplemental Research Task. Analytical tools utilized at each step for the evaluation of the alternative contracting methods (A+B Bidding, Lump Sum Contracting, No Excuse Bonus, Incentive/Disincentive, and Design-Build) are shown alongside the activities.

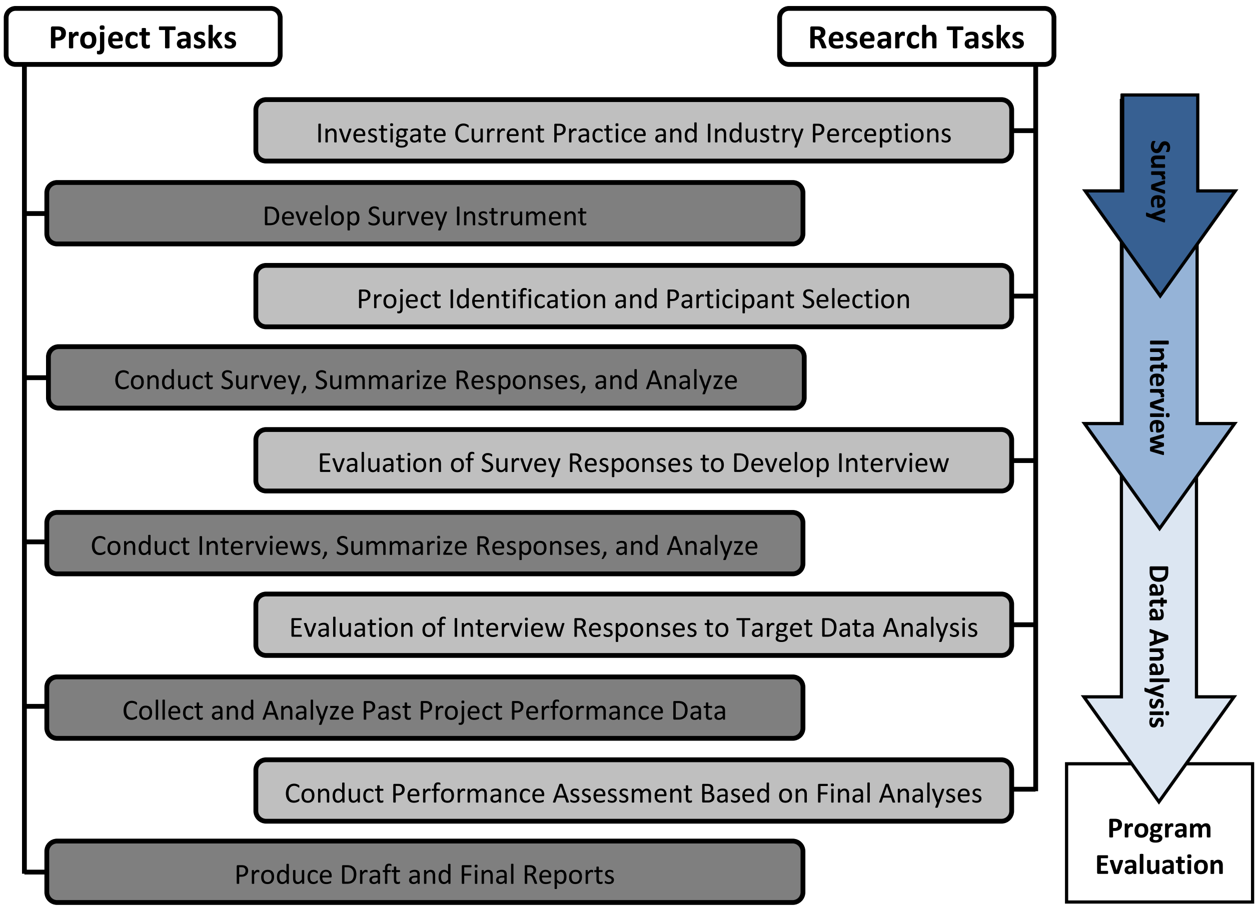


Figure 3-1: Sequence of Project Activities

As the first analytical tool in evaluating the five alternative contracting methods, the survey instrument sought to investigate literature on each method and compare these views with common practice. The survey also explored participant attitudes and obtained input on the significant advantages and disadvantages of each method.

The research team first reviewed cited work on the performance of each alternative contracting method. Next, overarching themes were compiled in regard to cost, time, quality, and other performance-based topics. The survey instrument was structured such that the job experience of the participants was assessed – including overall involvement within their current firm, exposure to the alternative contracting methods in question, and the number of alternative contracting projects on which they have previously worked. For each contracting method, the participants are presented with prevailing views (based on cited literature) and asked if they agreed or disagreed with the statement, or were unable to judge. Further, they were provided an opportunity to comment on the statements and were asked to list any significant advantages and disadvantages for the contracting methods.

As the second analytical instrument in evaluating the contracting methods, the interview instrument further explored prominent issues and sentiments elicited from the survey questions, and general concerns expressed by various individuals in the commentary responses.

Following analysis of the survey instrument, the research team obtained insightful information regarding perceived versus actual practices for each of the five contracting methods. Responses to the literature review helped confirm and refute major sentiments, highlighted conflicting issues between project agents, and offered further avenues of investigation via respondent feedback.

From examination of the survey responses, the interview instrument was developed to further investigate the following issues: the industry's perception on how effectively and efficiently each contracting method is operating under the FDOT's direction; issues and concerns that should be addressed – whether in the administration, implementation, or practice of each method; conflicting sentiment between project parties, and among state districts; and overall views on means of improvement.

While the first two tools gathered, interpreted, and evaluated personal opinions and industry views from willing participants, the third analytical tool was implemented to investigate purely empirical data. This project data analysis further assed the value of each alternative contracting method, as compared to Design Bid Build, with specific interest to the cost, time, and quality performance of each.

Data Acquisition

In gathering information for the project, two individual datasets were employed:

- a dataset of completed highway construction projects from which to select survey and interview participants
- a dataset of completed highway construction projects from which to perform cost, time, and quality analysis

While these two datasets contained minor discrepancies, these incongruities had no adverse effects on the overall research project. Dataset A (provided by the FDOT Central Construction Office) was used to solicit survey and interview participants with previous experience with FDOT alternative construction projects, and comprised completed projects using the following contracting methods: A+B Bidding, Lump Sum Contracting, No Excuse Bonus, Incentive/Disincentive, and Design Build.

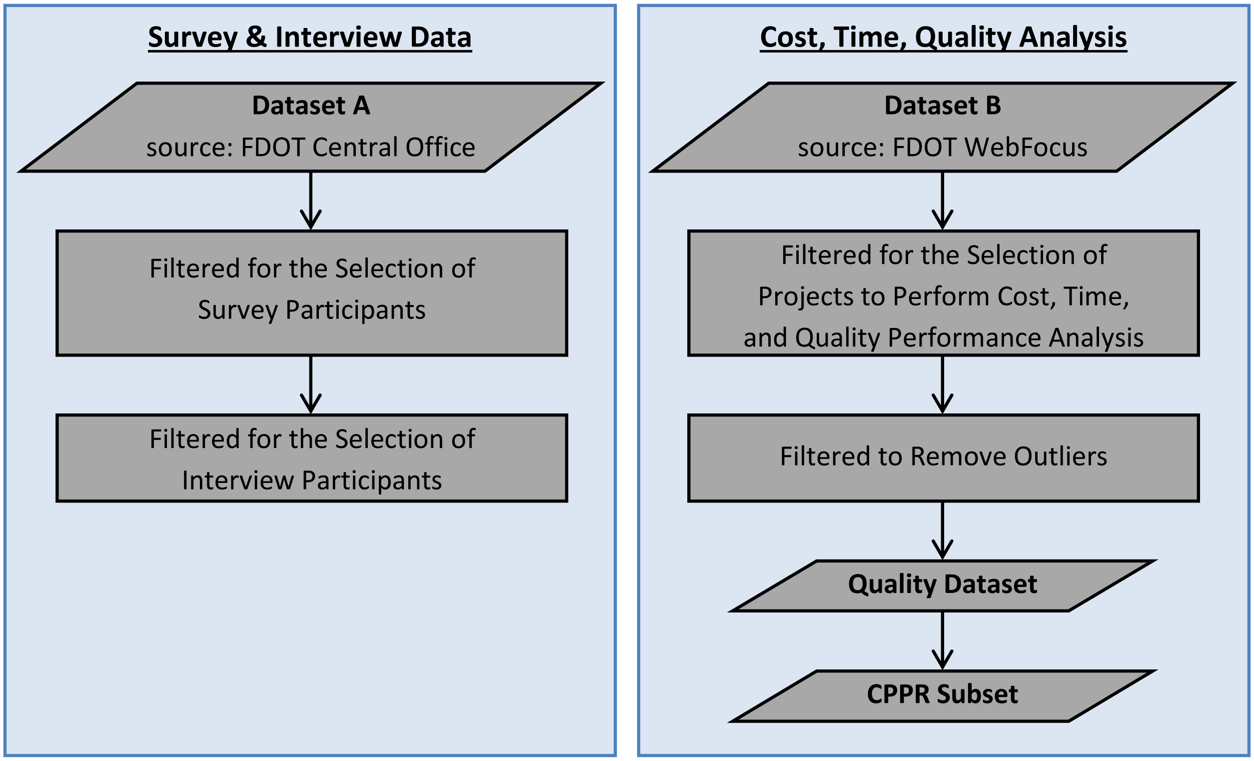


Figure 3-2: Project Dataset Filtering Process

Dataset B (collected from the FDOT's WebFocus database) was used to perform project past performance analysis, and comprised completed projects using the following the five aforementioned contracting methods in addition to Design Bid Build and the subcategorization of Design Build (Minor) and Design Build (Major). Subsets derived from Dataset B were used in the analysis of quality performance, and are explained in further detail in following sections. Figure 3-2 shows the initial filtering of information for the two datasets.

Survey Data

The research team was provided a comprehensive database of alternative contracting projects from the FDOT Central Construction office with contract let dates ranging from July 13, 2006, to March 25, 2015. Approximately 1,448 unique contract IDs were represented in the dataset (Dataset A). These 1,448 projects were culled down to a representative sample, as illustrated in Figure 3-2. In all, the process entailed classifying the projects by cost (eliminating those under $1 million); categorizing the projects by contracting method (selecting only those of interest); and identifying the projects by type (rejecting those not directly involved in major highway construction).

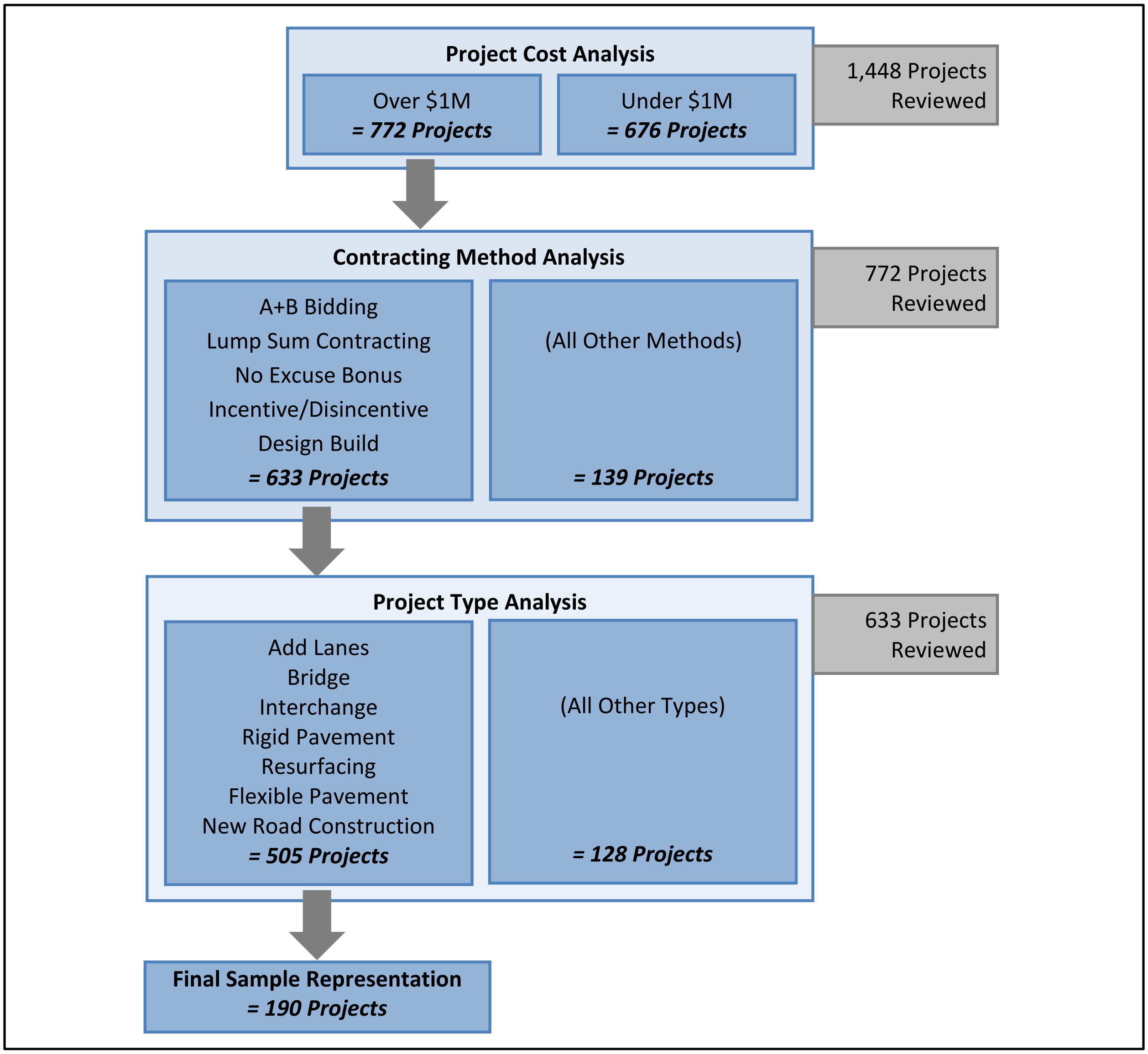
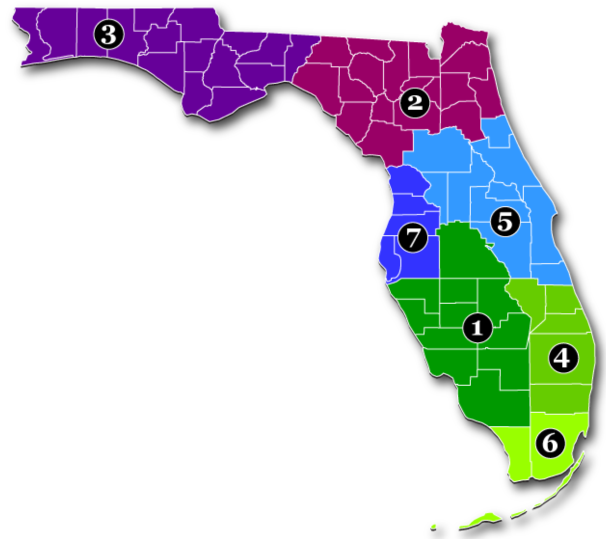


Figure 3-3: Survey Participant Selection Process

Participants for the surveys were comprised of Designers, Contractors, and Inspectors that previously worked on highway construction projects from select jobs. These three categories were selected to cover all aspects of highway construction from the beginning design phase, through construction and final inspection. Furthermore, the Inspector category includes both individuals directly involved in the inspection of the selected projects as well as additional personnel (such as FDOT contacts) who have a vested interest in the delivery, quality, and performance of the overall project.

The projects were first broken down by FDOT district offices, illustrated in Figure 3-4 in order to identify regional workload capacity. Next, the projects were categorized by total project costs: those under $1 million, and those over $1 million. Projects whose costs exceeded $1 million were identified as having the greatest probability to have implemented cost and/or schedule savings measures on behalf of the designers, contractors, or other agents. Quality was also assumed to have been a significant factor for projects over $1 million, and as such these projects were also most likely to have used one of the alternative contracting methods of note.



District	Geographic Region
District 1	Southwest Florida
District 2	Northeast Florida
District 3	Northwest Florida
District 4	Southeast Florida
District 5	Central Florida
District 6	South Florida
District 7	West Central Florida
District 8	(Turnpike)

image courtesy of www.floridabicycle.org

Figure 3-4: FDOT District Map and Corresponding Geographic Region

After separating projects by total cost, those over $1 million (772 projects) were grouped by alternative contracting methods. Per the FDOT, each project number had a contracting key code – or multiple codes – that corresponded with the alternative contracting method. Only those projects whose contracting method was of interest were considered. Because the FDOT distinguishes between Design Build Minor and Design Build Major, both methods were considered, individually. Design Build Major projects are identified as limited access facilities, buildings, rail corridor projects, and major bridges. Design Build Minor projects are identified as projects excluded under Design Build Major (i.e., those not formerly allowed under Section 337.11(7) of the Florida Statutes). Projects having multiple contracting methods were excluded in order to better analyze the independent influence of each contracting method on the projects. The only exception made was with the combination of A+B and Incentive/Disincentive due to literature strongly supporting the effectiveness of pairing these methods. Table 3-1 lists the contracting methods identified and their corresponding contracting key code, as identified by the FDOT.

Table 3-1: Alternative Contracting Methods Selected for Investigation

Alternative Contracting Method	Corresponding FDOT Contracting Key Code
Design Build, Minor	A3
Lump Sum	B0
No Excuse Bonus	B1
A+B	B2
Incentive/Disincentive	B5
Design Build, Major	B8

Next, the remaining 633 projects were classified by project type. Descriptions of each project were provided in the extensive database file (Dataset A), and these were categorized into one of seven categories that pertained to highway construction. Descriptions that did not deal exclusively with heavy/highway construction were excluded (e.g., lighting, landscaping, information services, etc.). Table 3-2 lists the final categorization of the project descriptions and the original classifications they included, per FDOT's project description.

Table 3-2: Project Types Selected for Investigation

Categorized Project Description	Corresponding FDOT Project Type Code	Original Project Description
Add Lanes	T1	Add Lanes
		Add Lanes & Reconstruct
		Add Lanes & Rehabilitate Pvmnt.
		Add Left Turn Lane(s)
		Add Right Turn Lane(s)
		Add Thru Lane(s)
Bridge	T2	Bridge Replacement
		Bridge-Repair/Rehabilitation
		Bridge-Replace and Add Lanes
		New Bridge Construction
		Replace Low Level Bridge
Interchange	T3	Interchange (Modify)
		Interchange (New)
		Interchange Improvement
		Intersection Improvement
Rigid Pavement	T4	Rigid Pavement Reconstruction
		Rigid Pavement Rehabilitation
Resurfacing	T5	Maintenance Resurfacing (Flex)
		Resurfacing
		Widen/Resurface Exist Lanes
Flexible Pavement	T6	Flexible Pavement Reconstruct.
New Road Construction	T7	New Road Construction

It should be noted that while the research team investigated project type information from Dataset A for the purposes of conducting both the survey and interview, classification by project type was not within the purview of the project scope, and was not a technique employed in the empirical analysis of Dataset B.

From these 505 projects, the research team selected specific ones to provide a distribution among the districts, contracting methods, and project types of note. Efforts were also taken to select a variety of costs ranges and in the end, 190 projects were chosen for investigation. And while all attempts were made to evenly distribute the samples among the contracting methods and project types, there were restrictions presented by the limited availability of every project option. Table 3-3 provides a complete breakdown of the contracting methods and project types by district. Figures 3-5 and 3-6 provide illustration of the contracting method and type distributions, respectively. (A more detailed breakdown of the distribution of contracting methods and project types, by district, can be found in Appendix B.)

Table 3-3: Project Breakdown by District, Contracting Method, and Project Type

	DB (Min.)	LS	NEB	A+B	A+B, I/D	I/D	DB (Maj.)	Totals	Add Lanes	Bridge	Interchange	Rig. Pvmnt.	Resurf.	Flex. Pvmnt.	New Const.
District 1	14	3	2	5	7	6	5	**42**	9	9	7		14	1	2
District 2	5	11				2	7	**25**	2	7	3		12		1
District 3	4	1	1	1	7	1	2	**17**	5	4		1	7		
District 4	2	3	8			6	4	**23**	6	5	1		10	1	
District 5	5	8		3	6	4	7	**33**	20	8	1		4		
District 6	1	2			6	11	3	**23**	3	2	2	2	8	4	2
District 7	2	3	1	1	6		3	**16**	6	1	2	2	5		
District 8	1	4				4	2	**11**	5		5		1		
	34	**35**	**12**	**10**	**32**	**34**	**33**	**190**	**56**	**36**	**21**	**5**	**61**	**6**	**5**

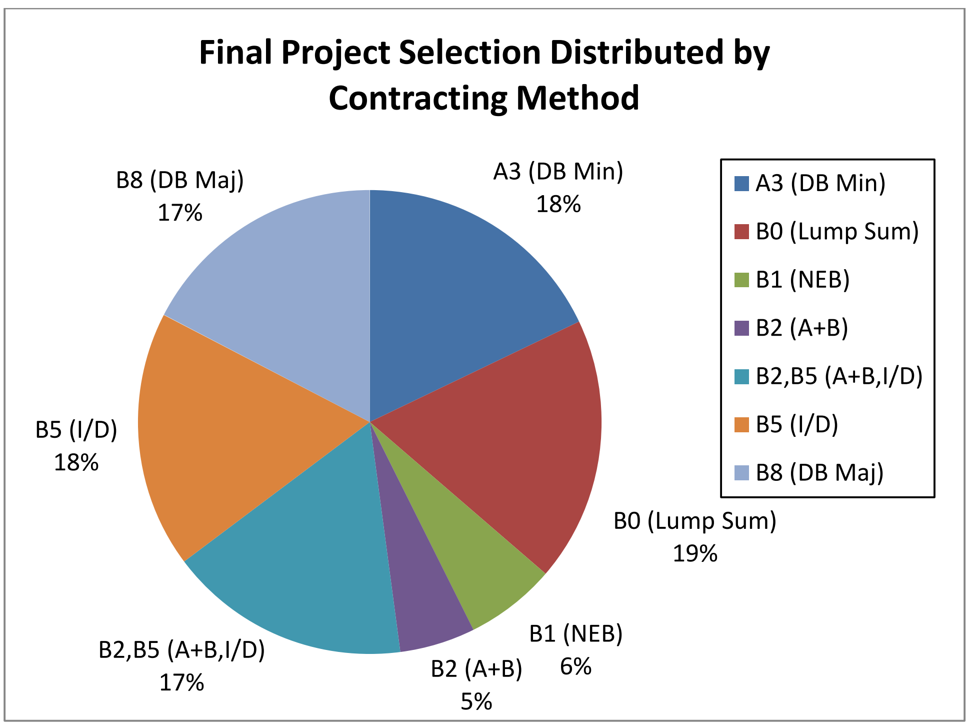


Figure 3-5: Final Project Selection Distributed by Contracting Method

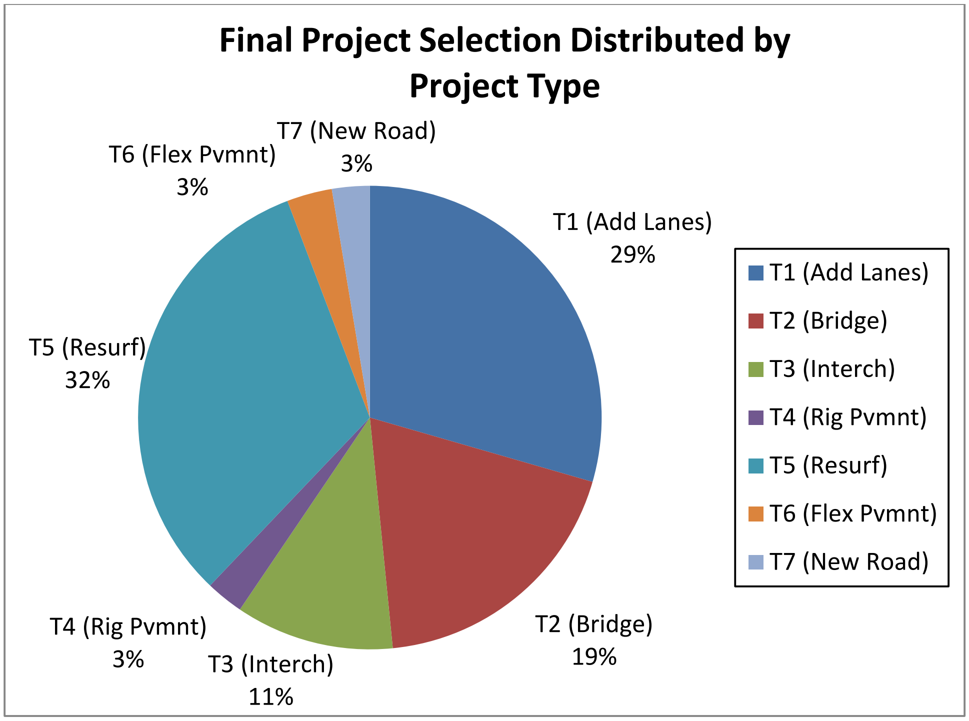


Figure 3-6: Final Project Selection Distributed by Project Type

From there, district construction engineers were asked to provide the names, agencies, phone numbers, and email addresses for all designers, contractors, and inspectors that previously worked on the chosen highway construction projects. Email correspondences were then sent to these individuals with a link to the project survey.

<u>Interview Data</u>

Interview participants were selected from among the pool of survey respondents. More specifically, participants who provided additional survey commentary were the targeted base of the interview candidates. Those individuals who supplied observations, examples, and commentary to our survey questions were considered potentially receptive towards participating in a comprehensive questionnaire.

Of the original 101 survey participants, 61 individuals voluntarily provided commentary to the survey questions while 40 individuals did not. These 61 individuals comprised the initial interview candidate pool. From these 61 individuals, 39 were responsive to the research team's communications and agreed to participate in the interview. On three separate occasions, scheduled interview participants invited their fellow colleagues to join in the interview process. As such, three additional individuals (outside the original list of candidates established by the survey commentary) were added to the final pool, totaling 42 interview participants. Figure 3-7, below, graphically illustrates the selection of the interview participants.

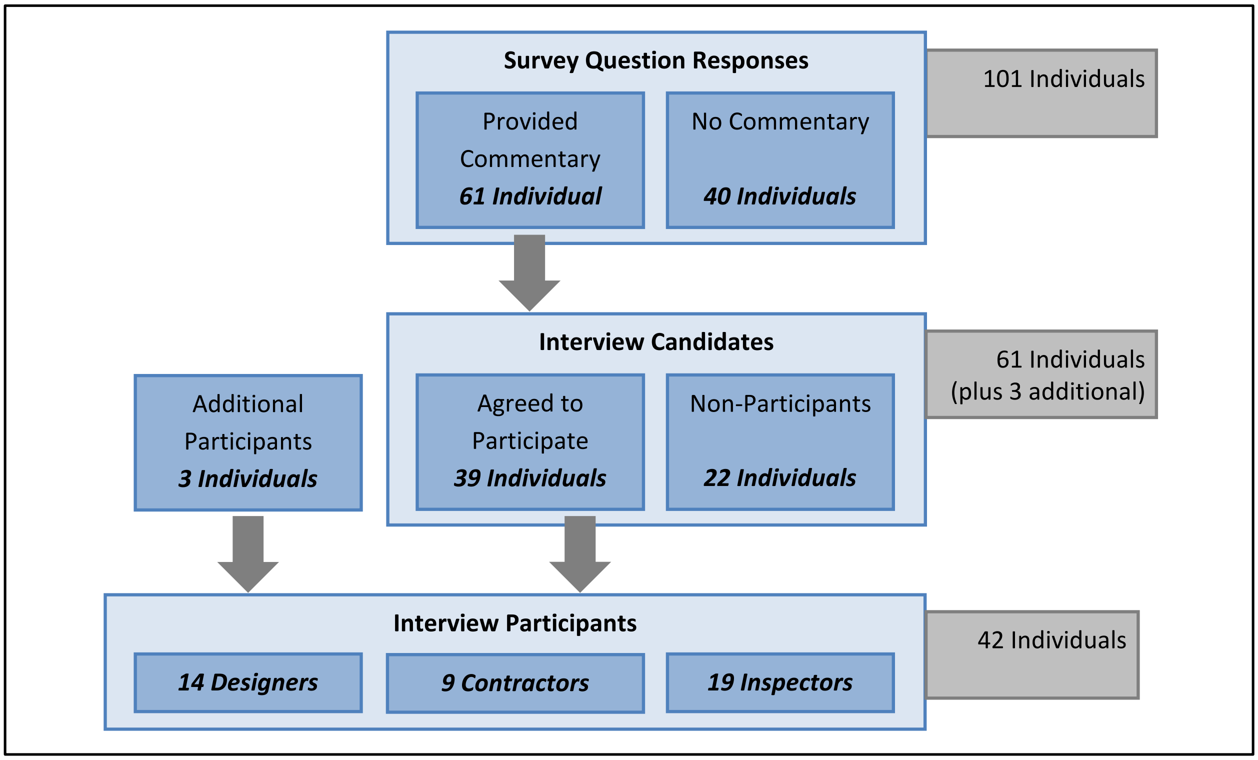


Figure 3-7: Interview Participant Selection Process

After identifying the initial pool of interview candidates from the list of individuals that provided commentary on the survey instrument, the candidates were divided by district and were identified by participant category (whether Designer, Contractor, or Inspector), years of "personal" experience (within their current place of employment), and years of "project" experience (with the select alternative contracting methods). Based on their level of familiarity with each alternative method, the candidates were then ranked in order of preference (as a basis for contact prioritization), and the final distribution list of interview candidates was achieved. While the rankings were arbitrary, they aided in targeting individuals with the most experience and potential knowledge to contribute.

Comparing the total number of survey participants to the number of interview participants, the respondent category breakdown reflects similarly distributed populations. As presented in Table 3-4, and illustrated in Figure 3-8, the proportion of Designers, Contractors, and Inspectors are fairly proportional for the two stages of the research project: with Inspectors comprising the largest group of respondents (approximately 45-50%); followed by Designers (approximately 30-33%); and then Contractors (approximately 20%). Attaining these similar distributions was vital in maintaining the interview response views consistent with the initial survey response views. By preserving the percentages in each category, accurate assessments could be made regarding participant sentiment towards the contracting methods.

Table 3-4: Survey Respondent Breakdown vs. Interview Respondent Breakdown

	Survey Respondent Breakdown				Interview Respondent Breakdown			
	Designers	Contractors	Inspectors	Totals	Designers	Contractors	Inspectors	Totals
District 1	7	4	5	16	2			2
District 2	7	2	3	12	3	1	4	8
District 3	2	2	4	8		3	2	5
District 4	3	1	4	8	3	1	4	8
District 5	2	4	13	19		1	3	4
District 6	7	2	19	28	2	1	6	9
District 7	2	3	2	7	2	1		3
District 8	1	2	0	3	2	1		3
Totals:	31 *(30.7%)*	20 *(19.8%)*	50 *(49.5%)*	101	14 *(33.3%)*	9 *(21.4%)*	19 *(45.2%)*	42

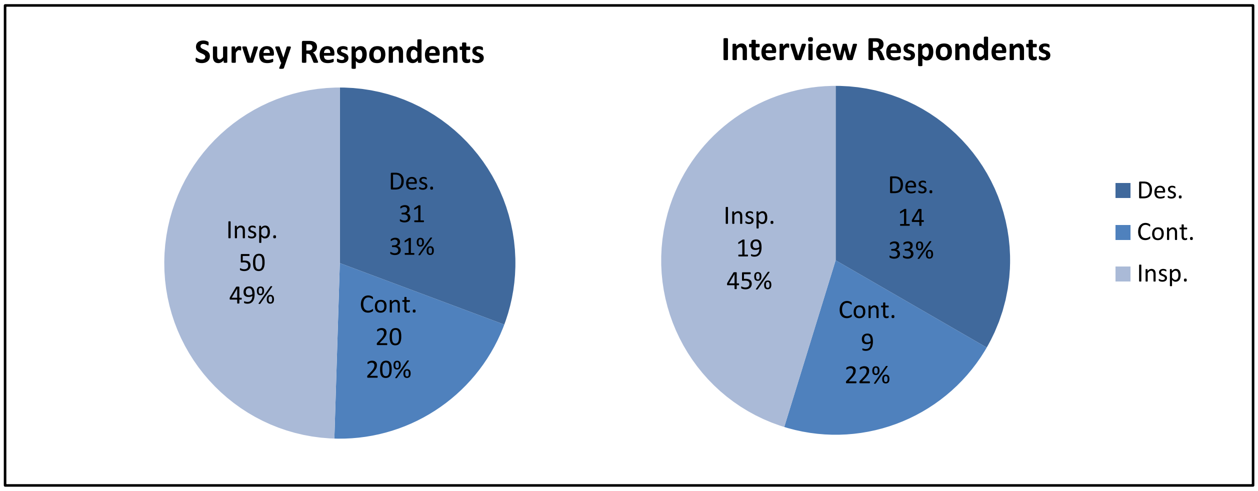


Figure 3-8: Survey and Interview Respondents

Interviews were conducted face-to-face with the eight FDOT district offices serving as central meeting locations. Accommodations were made for candidates that were unavailable to meet in person – either by means of telephoned communications or emailed correspondence. And while effort was taken to solicit the responses of all 61 interview candidates, only 42 participated in the interview process.

Cost, Time, and Quality Performance Analysis Data

Information for performance analysis (Dataset B) was obtained from the WebFocus database maintained by the Florida Department of Transportation. Information was gathered on all completed projects (via "Pass to Comptroller" status), and projects were filtered for those having letting dates between July 13, 2006 and March 25, 2015. The former date provided a continuation of the FDOT's prior 2007 research on alternative contracting; and the latter allowed the inclusion of completed projects since the onset of this current research project.

A total of 2721 completed projects were initially retrieved, all of which were among the alternative contracting methods pertinent to the research as well those classified as Design Bid

Build (as the basis of comparison for performance evaluation). A subdivision of the Design Build category was also performed to include Minor and Major work. In all, a total of seven contracting methods were investigated: Design Bid Build, Design Build (DB) Minor, Design Build (DB) Major, Lump Sum, Incentive/Disincentive, A+B, and No Excuse Bonus.

Parallel to the filtering process performed on Dataset A, Dataset B eliminated projects based on type (once again, rejecting those not directly involved in heavy/highway construction). Upon investigating projects that exhibited conflicting information, three projects were found to have been terminated and were, thus, considered outliers and excluded from analysis. In the end, 2,436 projects were investigated for cost, time, and quality performance. Table 3-5 and Figure 3-9 provide illustration of the pairing down process, and distribution of the projects, respectively.

Table 3-5: Final Distribution of All Projects by Alternative Delivery Method

Delivery Method	Original Number of Projects	Removed by Description	Removed as Dataset Outlier	Final Total Analyzed
Design Bid Build	1,654	157	2	**1,495**
Design Build (Minor)	147	-	-	**147**
Design Build (Major)	86	-	-	**86**
Lump Sum	728	125	1	**602**
Incentive/Disincentive	73	-	-	**73**
A+B	21	-	-	**21**
No Excuse Bonus	12	-	-	**12**
Total	**2,721**	**282**	**3**	**2,436**

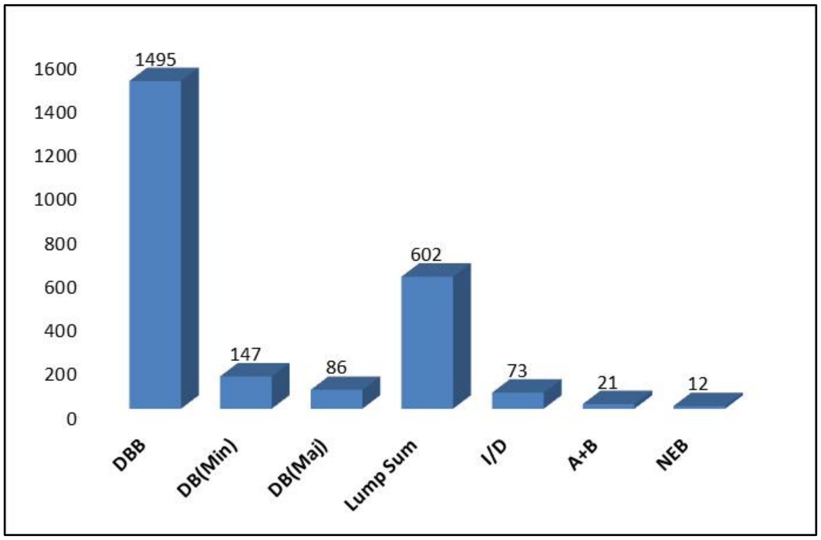


Figure 3-9: Final Distribution of Projects by Alternative Delivery Method

It is worth noting, unlike the filtering process used with Dataset A, Dataset B did not filter projects on the grounds of total cost to permit the full analysis of individual project cost categories.

Quality Analysis Data

While cost, time, and quality performance analyses all originated from Dataset B, quality investigations warranted the additional filtering of projects by available Contractor Past Performance Rating (CPPR) scores. Of the original 2,436 projects investigated for cost and time performance, those with CPPR zero scores (likely the result of incorrect data entry) were considered outliers and eliminated. The resulting set of 2,361 projects was termed the "Quality Dataset". As a means to focus attention on contractor coordination and conformance, CPPR category subscores (which have only recently been recorded) were investigated. The resulting set of 1,038 projects was termed the "CPPR Subset". Table 3-6 presents the distribution of the Quality Dataset and CPPR Subset.

Table 3-6: Quality Dataset and CPPR Subset Distribution by Contracting Method

Delivery Method	Original Projects in Dataset B	Removed as Dataset Outliers	Total in Quality Dataset	Total in CPPR Subset
Design Bid Build	1,495	37	1,458	689
DB (Minor)	147	1	146	60
DB (Major)	86	7	79	22
Lump Sum	602	24	578	264
Incentive/Disincentive	73	2	71	3
A+B	21	2	19	-
No Excuse Bonus	12	2	10	-
Total	**2,436**	**75**	**2,361**	**1,038**

Procedures

Each of the three analytical tools employed during the research project – the survey, the interview, and the performance data analysis – required a distinct set of activities to advance the progress of the research project. Both the survey and interview tools required four primary activities: (1) developing the instrument; (2) conducting inquiries; (3) summarizing responses; and (4) analyzing results. The performance data analysis tool required only two major activities: (1) collecting data; and (2) analyzing performance. While the summary and analysis of information is provided in chapters 4 and 5, the development, execution, and collection of information are discussed herein.

Survey Procedures

At the onset of the research project the survey instrument sought to investigate literature on each method and compare these views with common practice. The research team first reviewed cited work on the performance of each alternative contracting method. Next, overarching themes were compiled in regard to cost, time, quality, and other performance-based topics.

The survey instrument was structured such that the job experience of the participants was assessed – including overall involvement within their current firm, exposure to the alternative contracting methods in question, and the number of alternative contracting projects on which they have previously worked. For each contracting method, the participants were presented with prevailing views (based on cited literature) and asked if they agreed or disagreed with the statement, or were unable to judge. Further, they were provided an opportunity to comment on the statements and were asked to list any significant advantages and disadvantages for the contracting methods.

After the projects of interest were selected and survey participants were identified, surveys were distributed to the individuals via emailed links to the online survey. When attempts to solicit additional responses were exhausted, and a taper in activity was evident, respondent information was tabulated.

Interview Procedures

The interview instrument sought to explore prominent issues and sentiments elicited from the survey questions, as well as address general concerns expressed by various individuals in the commentary responses of the survey.

As such, the interview instrument was developed to further investigate the following issues: the industry's perception on how effectively and efficiently each contracting method is operating under the FDOT's direction; issues and concerns that should be addressed – whether in the administration, implementation, or practice of each method; conflicting sentiment between project parties, and among state districts; and overall views on means of improvement.

Once participants were identified by their detailed survey responses (indicative of a potential willingness to volunteer personal experience), they were categorized by district, participant category, and years of experience. The research team then divided the list of contacts, scheduled and arranged trips to the eight district offices and met with interview participants.

When attempts to solicit additional participants were exhausted, and it appeared the interview responses were becoming redundant (in that no new content was being added to the analysis), interview remarks were tabulated.

Cost, Time, and Quality Performance Analysis Procedures

The final analytical tool provided for the empirical investigation of project performance indicators. The calculation of savings and overruns with regard to project cost and time, in addition to the valuation of project quality, provided a means to view and compare overall performance evaluations for the alternative contracting methods in question.

With consideration of how the data would be best analyzed, and at the behest of the FDOT, the projects were broken up into cost categories based on commonly used contract cost divisions. The categories formed were as follows: under $1 million; $1 to $5 million; $5 to $10 million; $10 to $20 million; and above $20 million. The breakdown of projects by contract cost is shown in Table 3-7 for all categories, and a subdivision of the highest (above $20 million) category is shown in Table 3-8.

Table 3-7: Distribution of Projects by Cost Categories

Delivery Method	Total	Number of Projects								
		Under $1 Million	Above $1 Million							
			Total	Below $10 Million			Above $10 Million			
				$1 to $5 Million	Above $5 Million	Total	$10 to $20 Million	Above $20 Million	Total
Design Bid Build	**1,495**	609	886	658	135	793	63	30	93
Design Build (Minor)	**147**	89	58	42	10	52	3	3	6
Design Build (Major)	**86**	15	71	27	10	37	12	22	34
Lump Sum	**602**	357	245	205	31	236	8	1	9
Incentive/Disincentive	**73**	16	57	36	13	49	5	3	8
A+B	**21**	0	21	6	3	9	6	6	12
No Excuse Bonus	**12**	0	12	5	4	9	2	1	3

Table 3-8: Distribution of Projects over $20 Million

Delivery Method	Tot.	Above $20 Million								
		$20 to $30 M	$30 to $40 M	$40 to $50 M	$50 to $60 M	$60 to $70 M	$70 to $80 M	$80 to $90 M	$90 to $100 M	$100 to $125 M
DBB	**30**	16	7	2	1	2	0	1	1	0
DB (Minor)	**3**	1	2	0	0	0	0	0	0	0
DB (Major)*	**21**	10	6	2	0	1	1	0	0	1
Lump Sum	**1**	1	0	0	0	0	0	0	0	0
I/D	**3**	1	0	1	0	0	0	0	0	1
A+B	**6**	4	1	0	1	0	0	0	0	0
NEB	**1**	1	0	0	0	0	0	0	0	0

**Design Build has 1 project worth $438 million*

Collectively analyzing projects of different sizes in terms of current contract amount could not convey the true story since large projects exert a greater influence on the results. The value of that variable would not be interpreted the same way for different cost categories. As an example, if the percentage change of actual cost over current cost was 10% for projects under $1 million then the best interpretation here is that the actual cost was around $100,000 (10% of $1 million) more than the current cost. Similarly, if the percentage change of actual cost over current cost was 10% for projects above $20 million then the best interpretation here is that the actual cost was around $2 million (10% of $20 million) more than the current cost. Furthermore, as a large majority of the projects were under $1 million, evaluating the contracting methods by cost categories prevented skewing the calculations from influence of the higher-priced projects.

After categorizing by cost, projects were broken down by cost overruns or cost savings on the contract amounts. Similarly, breakdowns of the projects that were completed early, on time, and delayed were also determined. Then, summaries of the cost and time analyses (as broken out by cost categories) were tabulated for the contracting methods of interest. From there, steps were taken to identify potential project outliers and, subsequently, screen out the valid anomalies. In this step, only three projects were deemed as true outliers (termed "dataset outliers") and taken out from analyses in this report. A few projects were identified as potential outliers through statistical methods (termed "statistical outliers"), but were not excluded from the analyses.

Average Cost and Time Savings Analysis Procedures

Within the FDOT database, project costs were recorded under four distinct categories: original contract amount, current contract amount, estimated contract amount, and estimate paid to date. Distinguishing between the terms is important in understanding calculations presented herein:

- original contract amount: total amount shown in the contractual agreement, which is often equivalent to the low bid price under conventional Design Bid Build contracting
- current contract amount: equal to the original contract award price plus any change orders
- estimated contract amount: the engineer's estimate used to help the DOT set a budget and evaluate bidders
- estimate paid to date: actual total amount of money paid to the contractor by the department after the project is completed

Similar to cost, project times were also recorded under different categories: original contract days, current contract days, and days used. Again, definitions are provided as follows:

- original contract days: the engineer's estimated contract duration, which is used as a benchmark for bid evaluation
- current contract days: the present contract duration after including change orders
- days used: actual time taken by contractors to finish a project

While the aforementioned cost and time categories are employed by the FDOT in monitoring project performance in a multitude of ways, the research team used current contract days as well as days used to assess time performance of the contracting methods. Current contract amount and estimate paid to date were used to evaluate performance of the contracting methods in terms of cost. To provide a better understanding as to the performances of the contracting methods, both absolute and relative values of time and cost savings (or losses) were produced and presented in the report per cost categories.

The time analysis was done using the current contract period (i.e., the present contract duration after including change orders), and days used (i.e., actual duration of the project). The percent change of days used over current per contracting method for the individual cost category was calculated using the above mentioned data points:

$$\text{Percentage change of days} = \frac{[\sum(\text{Days used}) - \sum(\text{Current contract period})]}{\sum(\text{Current contract period})}$$

The average days saved per project contracting method for the individual cost categories was calculated using the above mentioned data points and the number of projects:

$$\text{Average days saved} = \frac{[\sum(\text{Current contract period}) - \sum(\text{Days used})\ ]}{\text{Number of projects}}$$

The cost analysis was carried out using the current contract cost (i.e., the present value of the contract after including change orders), and estimate paid to date (i.e., the actual cost paid for the contract). The percent change of actual over current cost per contracting method for the individual cost categories was calculated using the following formula:

$$\text{Percentage change of cost} = \frac{[\sum(\text{Actual cost}) - \sum(\text{Current contract cost})]}{\sum(\text{Current contract cost})}$$

The average cost saved per contracting method for the individual cost categories was calculated using the following formula:

$$\text{Average cost saved} = \frac{[\sum(\text{Current contract cost}) - \sum(\text{Actual cost})\ ]}{\text{Number of projects}}$$

Identification of Potential Outliers

As outliers have the potential to distort analysis results, producing misleading conclusions and false inferences, it was critical to identify all potential outliers in the dataset and screen out true outliers.

The first basic type of outlier, caused by errors introduced in the process of data collection, storage, and transfer, is the most difficult to discover and should be eliminated from analysis since the flawed data points lead to erroneous results. The second type of outlier results from abnormal events, such as termination and abortion of projects, and should also be dropped from the analysis since they can reduce the extent of contrast or even shift results in the opposite direction. And the third type of outlier is produced under extreme conditions (e.g., “Act of God”; differing site conditions) or abnormal situations (e.g., excessively long material delivery delays; social, political, or economic disturbances), which can yield extremely long project durations or escalate project price. This type of outlier should be carefully examined and used with caution.

To detect outliers, the research team employed the 2 & 3 Sigma method to highlight potential projects, with approximately 95-99% confidence, and then investigated detailed project information to determine whether in fact these projects were true outliers.

95% Confidence Interval (CI) with 2 Sigma: [Upper Bound, Lower Bound] = $\bar{X} \pm 2\,\hat{\sigma}$

99% Confidence Interval (CI) with 3 Sigma: [Upper Bound, Lower Bound] = $\bar{X} \pm 3\,\hat{\sigma}$

Where $\bar{X}$ denotes average cost or time, and $\hat{\sigma}$ stands for the standard deviation of cost or time.

This research first reviewed all selected projects by looking at obvious errors within the projects, or projects that were abnormally terminated. It was found that three projects were terminated much earlier than the contract finish date. After confirmation from the FDOT, these projects were eliminated from analysis. The 2 & 3 Sigma approach were then applied to the remaining projects in each delivery method. Further, graphical representations via bar charts with two horizontal lines representing the lower and upper bounds were created. The research team did not eliminate any potential outlier projects identified by the 2 & 3 Sigma method from the original analysis. *(Supplemental analyses removing the 2 & 3 Sigma method outliers were performed and provided in Appendix H for the benefit of the department.)*

Quality Analysis Procedures

The projects which were previously investigated for time and cost performances (Dataset B) were now grouped by project delivery system and investigated for the quality analysis portion of the research project.

While quality remains a subjective variable to evaluate, the FDOT has taken measures to assess project performance and provide practical benchmarks for comparison. Among the tools used to gage overall project value and quality are contractor performance evaluations and material testing scores. As such, the research team initially decided to investigate Contractor Past Performance Rating (CPPR) scores as provided in the WebFocus database, and sample test performance as stored under the Laboratory Information Management System (LIMS) database.

CPPR scores reflect the FDOT's "grade" for prior work, including conformance with project specifications and environmental constraints, time and cost overruns, as well as interactions with the public and inspection personnel – these details being indicative of the contractor's performance. Likewise, the LIMS database supplies the exact number of material quality test successes as required per the project specifications – these assessments being representative of project quality control.

Upon further investigation, however, it was decided that the LIMS database could not provide sufficient information to assess project quality. While the original intent of using LIMS was to obtain the number of "pass" and "fail" material testing procedures conducted per project (the assumption being that a percentage "pass" tests over the total number of tests performed could demonstrate project quality), it was concluded that the percentage of successful tests could not be accurately compared because the tests themselves were project type-specific. In other words, a resurfacing project would require an entirely different set of quality testing as would a bridge construction project. And as the research project focused solely on contracting method and cost category breakdowns, project-type investigations were not within the scope of this project. Furthermore, the final quality of a project may not be dependent upon the number of failed tests because in order to meet the FDOT's final acceptance failed tests must either be remedied or the project engineer must sign off on modified acceptance parameters. In either case, the final project will have met the necessary requirements detailed in the project specifications. And lastly, the LIMS database prohibits efficient extraction of project data. Consequently, the research focused solely on the investigation of CPPR scores to investigate the potential relation between delivery method and overall project quality.

Overall CPPR scores were gathered for Dataset B; the projects lacking scores were omitted as outliers; and the remaining projects were identified as the Quality Dataset (containing the 2,361 projects illustrated in Table 3-6). For each contracting method, the mean, mode, and median values were calculated to compare scores between methods.

Contractor performance is evaluated according to nine specific performance criteria. The number of points a contractor can earn in each of the nine categories is based on one of the following: (1) an equivalent percentage of satisfactory work completed; or (2) an equivalent number of deficiency letters received. After investigating the individual categories that comprise the overall CPPR score, the research team considered looking at the score breakdown, focusing primarily on Category 5 (coordination/cooperation with inspection personnel) and Category 8 (conformance with contract documents). (A brief description of all nine categories can be found in Appendix L.)

Category 5 represents the contractor's diligence in addressing possible violations observed by the project inspector. As such, the number of deficiency letters documents failure on the contractor's part to address these concerns in a timely manner. Category 8 addresses the contractor's ability to follow the requirements outlined in the project specifications. Looking specifically at the number of deficiency letters and quality of work percentage would provide key quality markers.

CPPR subscores were gathered for the Quality Dataset; the projects lacking subscores were omitted as outliers; and the remaining projects were identified as the CPPR Subset (containing the 1038 projects illustrated in Table 3-6). For each contracting method, the mean, mode, and median values were calculated to compare subscores between methods.

It should also be noted that A+B and No Excuse Bonus were not among the contracting methods represented within the CPPR Subset. This is likely due to the underrepresentation of these contracting methods in the overall investigations, as the research focused on use of the individual contracting methods and not the more likely combination of methods (which tends to be the case for A+B).

Chapter 4: Findings

Presentation of Findings

Survey Results

Based on the survey responses completed by the research participants, the following section provides a summation of key points and offers a preliminary assessment of contracting method performance. Survey results examined the total number of participants that either agreed or disagreed with the cited literature for each of the five contracting methods (A+B, Lump Sum, No Excuse Bonus, Incentive/Disincentive, and Design Build), as well as the combination of A+B and Incentive/Disincentive. The full survey instrument and participant responses are provided in Appendix B of this report. Respecting survey participant anonymity, all identifying information such as individual names, agencies, phone numbers and email addresses have been excluded.

Primary conclusions were based on the percentage agreement of the respondents with the claims based on prior literature findings. In order to interpret participant responses, the following percentage agreement categories were established:

- supported findings: statements with agreements exceeding 60%
    - these included "confirmed" statements with 60% - 79% agreement, and "highly confirmed" statements with 80% agreement or more
- mixed results: statements with 40% - 59% agreement; and
- refuted findings: statements with agreements below 40%
    - these included "refuted" statements with 20% - 39% agreement, and "highly refuted" statements with less than 20% agreement

The advantages and disadvantages listed for each method are an overview of recurring comments made by the respondents, and are listed by participant category when applicable.

Responses from the survey participants provided information characteristic of the highway construction industry as a whole. Attempts were made to obtain a representative sample among the eight districts and the three respondent categories; however, with an overall response rate of 23.5%, the research team exhausted all efforts to solicit participants.

Table 4-1: Survey Respondent Breakdown

	Total Distributed	Total Responses	Response Rate	Response Breakdown		
				Designers	Contractors	Inspectors
District 1	29	16	55.2%	7	4	5
District 2	41	12	29.3%	7	2	3
District 3	29	8	27.6%	2	2	4
District 4	42	8	19.0%	3	1	4
District 5	60	19	31.7%	2	4	13
District 6	169	28	16.6%	7	2	19
District 7	39	7	17.9%	2	3	2
District 8	20	3	15.0%	1	2	0
Totals:	**429**	**101**	**23.5%**	**31**	**20**	**50**

It must be mentioned, the total number of responses cited above refers to all individuals who answered at least one question, and may not have necessarily completed the entire survey. The reason why these individuals were unable (or chose not) to complete the survey is unknown. Discrepancy in the number of responses for each question also arise from individuals having no experience (or expressed opinion) on the method in question. Thus, when analyzing response rates for statement agreement, calculations were performed using the total number of responses for each individual question.

Figure 4-1 provides a graphical representation of the participants' years of experience with each of the main contracting methods. As is evident, most of the participants have between 1-5 years of experience with any of the methods. From there, the experience within each subsequent range tapers off with fewer participants having 20+ years of experience.

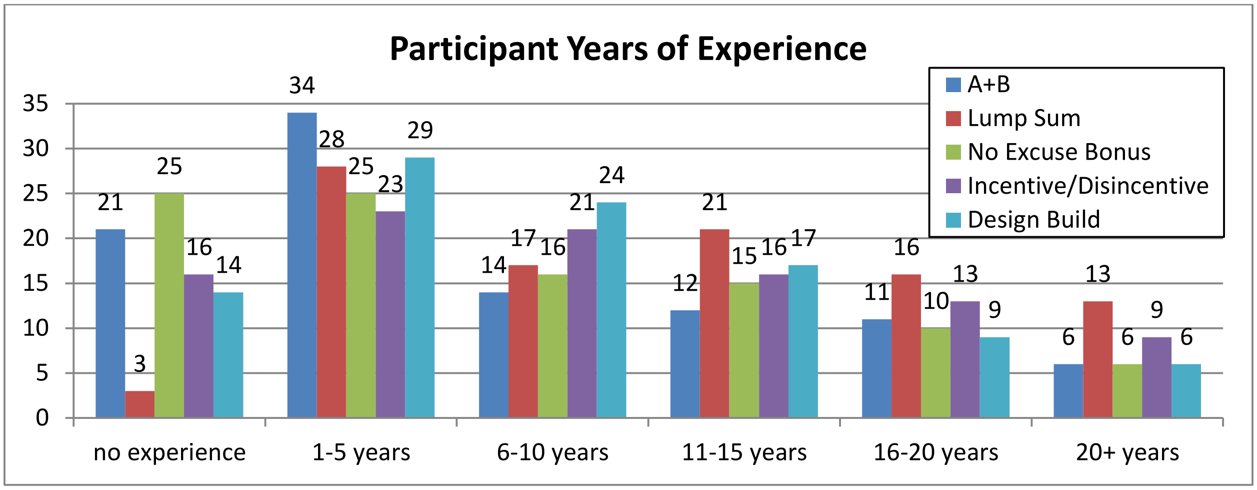


Figure 4-1: Participant Years of Experience for Each Contracting Methods

Lump Sum appears to be the most practiced method, having the least number of participants having no experience with the method. Conversely, No Excuse Bonus appears to be the least practiced, having the most number of participants having no experience with the method

Figure 4-2 provides a graphical representation of the participants' project experience with each of the contracting methods. Similar to years of experience, most of the participants have worked on between 1-5 projects with any of the methods. From there, the project experience within each subsequent range also tapers off, but more drastically than with years of experience. Far fewer participants had experience with projects in the 11-20, 21-50, and 51-100 ranges.

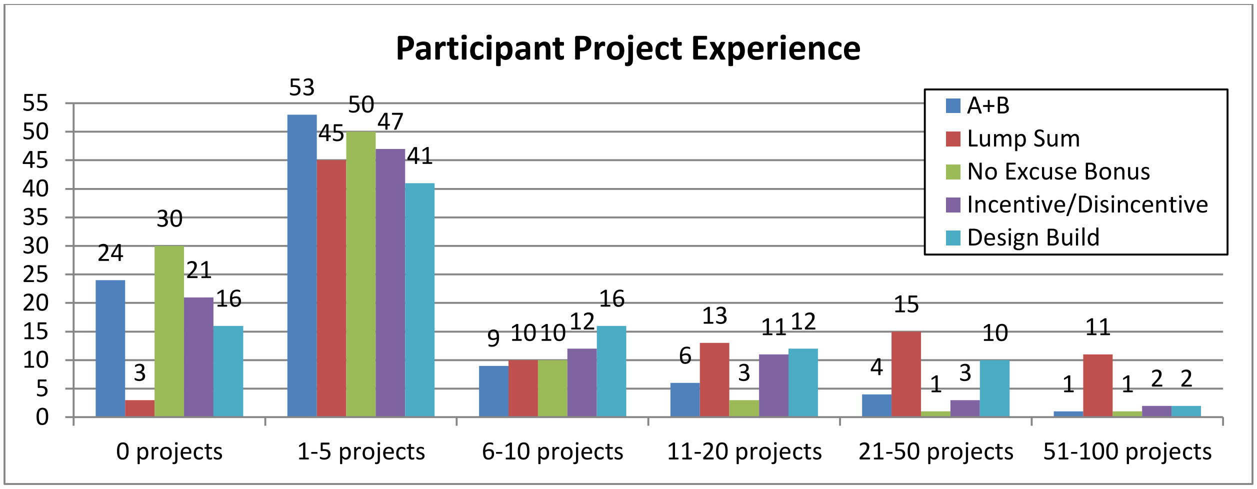


Figure 4-2: Participant Project Experience for Each Contracting Methods

As with years of experience, Lump Sum appears to be the most practiced method, having the least number of participants having no project experience with the method. And, conversely, No Excuse Bonus appears to be the least practiced, having the most number of participants having no project experience with the method.

A+B Bidding Survey Findings

Participant responses for A+B Bidding <u>supported</u> the following literature claims:

- A+B reduces contract time
- A+B is more influenced by inclement weather
- A+B results in most contractors completing the project on time or ahead of schedule
- A+B motivates contractors to work faster
- A+B motivates contractors to have more accurate scheduling
- A+B motivates contractors to have more efficient project management
- A+B motivates contractors to have better resource management
- A+B is best suited for reconstruction or rehabilitation projects that will disrupt traffic
- A+B is best suited for projects with lengthy detours or high traffic
- A+B has wide agency support
- A+B is frequently used with Incentive/Disincentive

Participant responses for A+B Bidding <u>refuted</u> the following literature claims:

- A+B is best suited for bridge projects

Specific statements raised contradictory or conflicting attitudes among the participant categories (Designers, Contractors, and Inspectors). Of note, were the following:

- 64% of designers believed A+B results in significant savings, while 75% of contractors <u>did not</u> believe so
- 79% of designers believed A+B is more influenced by weather, while 52% of inspectors <u>did not</u> believe so
- 87% of designers believed A+B is best suited for projects with lengthy detours or high traffic, while only 57% of inspectors believe so

- 63% of designers believed A+B has wide agency support, while 60% of contractors did not believe so

Recurring sentiment regarding advantages and disadvantages are noted in Table 4-2. Where applicable, participant categories are noted.

Table 4-2: Noted Advantages and Disadvantages for A+B Bidding

Advantages	Disadvantages
- Overall, A+B provides time savings - Contractors believed A+B provides cost savings for the owner - Contractors believed their access to resources helps set contract time and expedite completion - Inspectors believed the contractor has to develop a schedule and detail out the construction approach	- Overall, time reduction causes the project quality to suffer - Overall, contractors intentionally bid low on time and money - Designers believed the rushing of jobs affects quality and safety, and causes an increase in construction issues - Contractors and Inspectors believed the intentionally low bid is to win the contract - Inspectors believed the contractors bid low and then spend time, money, and effort in obtaining additional time for construction issues

Regarding general commentary on A+B Bidding, no major issues stand out above the rest but there are mixed comments regarding the quality of work (that it is not necessarily better or improved by the use of this method). Designers believed A+B should be used on projects that can benefit from time savings. Contractors feel the incentives are too small to differentiate between A+B and Design Bid Build, and that the cost and time savings are inconsistent. Inspectors believed the quality of work done from the contractor's side is usually not better than Design Bid Build.

Lump Sum Survey Findings

Participant responses for Lump Sum Contracting supported the following claims:

- Lump Sum causes contractors to add a greater contingency to their bids
- Lump Sum reduces time spent measuring quantities
- Lump Sum requires a higher demand on design quality
- Lump Sum causes contract administration to be much easier
- Lump Sum is best suited for simple (activity-wise) jobs
- Lump Sum is best implemented when the scope is defined and understood by all parties
- Lump Sum is best suited for projects that have well-defined risks
- Lump Sum is best suited for projects that have a low risk of unforeseen conditions
- Lump Sum is best suited for projects that have a low possibility of change

Participant responses for Lump Sum Contracting refuted the following claims:

- Lump Sum is best suited for projects when there exists uncertainty in quantity estimates

Specific statements raised contradictory or conflicting attitudes among the participant categories (Designers, Contractors, and Inspectors). Of note was the following:

- 55% of inspectors did not believe Lump Sum offers owner the best protection, while 56% of contractors believed it does.

Recurring sentiments regarding advantages and disadvantages are noted in Table 4-3. Where applicable, participant categories are noted.

Table 4-3: Noted Advantages and Disadvantages for Lump Sum Contracting

Advantages	Disadvantages
- Overall, the reduction of time and effort in tracking quantities - Designers believed it eases contract administration - Contractors and Inspectors believed it reduces administrative cost and paperwork	- Overall, there are increased risks and claims, as well as increased quantity discrepancies resulting for improper plan interpretation, contract changes, or unforeseen site conditions - Designers believed there exists an adversarial relationship with the contractor regarding discrepancies that often results in disputes and claims - Contractors believed quantity discrepancies arise from plan errors, contract changes, or unforeseen conditions - Inspectors cited issue with the contractor recouping costs through high bids or loopholes, as well as quality concerns (especially on the part of the contractor). They also mentioned the added effort required in negotiating extra work and change orders (which would normally have been an item overrun)

General sentiment for Lump Sum Contracting appeared to be directed towards the uncertainty in quantities and the appropriateness of this method versus typical unit costs. Designers commented that this method is well suited for all types of project scopes as well as levels of risk and noted that the risk is about the same as with Design Build. Contractors think that ease of contract administration and reduction in time and effort is only true with an accurate set of plans. Inspectors seemed to provide the most commentary, but there was no major argument for the method – lump sum and unit price were (conflictingly) both identified as the preferred method for unknown quantities.

No Excuse Bonus Survey Findings

Participant responses for No Excuse Bonus (NEB) supported the following claims:

- NEB often results in increased costs in order to cover unexpected delay risks
- NEB bonuses must outweigh the use of additional resources that are typically required to finish early

- NEB use of graduated bonuses are preferred to all-or-nothing bonuses
- NEB results in faster project completion
- NEB requires expending additional resources in order to finish early
- NEB utility schedules are critical
- NEB provides continual motivation throughout the project duration
- NEB is best suited for high visibility projects
- NEB is best suited for emergency situations

Participant responses for No Excuse Bonus (NEB) refuted the following claims:
- NEB contractors typically share bonuses with subcontractors to motivate their cooperation

Specific statements raised contradictory or conflicting attitudes among the participant categories (Designers, Contractors, and Inspectors). Of note, were the following:
- 91% of inspectors and 75% of designers did not believe contractors typically share bonuses with subcontractors to motivate their cooperation, while 50% of contractors believed they do
- 50% of designers and 58% of inspectors believed NEB is best suited for projects with large budgets, while 62% of contractors did not believe so
- 63% of contractors believed NEB is best suited for projects that can be constructed outside hurricane season, 64% of designers and 52% of inspectors did not believe it is
- 64% of designers and 63% of inspectors believed NEB is best suited for projects with high traffic, while 53% of contractors did not believe so

Recurring sentiment regarding advantages and disadvantages are noted in Table 4-4. Where applicable, participant categories are noted.

Table 4-4: Noted Advantages and Disadvantages for No Excuse Bonus

Advantages	Disadvantages
- Overall, there is a faster completion time and accelerated project schedule due to the contractor's motivation to finish early - Inspectors believed there is decreased impact to the public and minimized traffic disruption; and the burden of the completion falls on the contractor	- Overall, work quality decreases as the contractor expedites construction to complete the job early - Designers believed contractors will take the maximum amount of time allowed to complete the job if attaining the bonus is not possible - Contractors noted the difficulty of being subject to outside influences, and that the deadlines were unrealistic - Inspectors mentioned that unforeseen conditions make the project costly, and contractors that cannot meet the bonus requirements will abandon the accelerated schedule or file claims

Commentary for No Excuse Bonus had no general consensus but there were prevailing sentiments that understanding of the project and scope are vital as public disruptions and visibility are unavoidable. Designers noted this method is not always effective for high traffic and visibility projects. The sole comment from the contractors discussed how these projects (usually lasting over two years) are difficult to coordinate, season- and weather-wise. Inspectors make mention of the importance of utility coordination as they are a common impact; the use of contingencies to ensure bonus pay; and that emergency situations pose a lot of risk and have too many unknowns.

Incentive/Disincentive Survey Findings

Participant responses for Incentive/Disincentive (I/D) <u>supported</u> the following claims:

- I/D requires that unforeseen conflicts have timelier responses than traditional projects
- I/D projects are completed on time or early
- I/D increases the need for field inspections
- I/D is best suited for high volume (traffic-wise) projects
- I/D is best suited for large projects
- I/D is best suited for projects that will cause severe economic impact on local business
- I/D is best suited for projects that will impair emergency service success for a prolonged amount of time
- I/D is best suited for projects where the safety of road users or construction workers is at risk
- I/D is best suited for projects that require lengthy detours on poorly maintained roads
- I/D is best suited for projects that severely impact traffic on main arteries
- I/D is frequently used with A+B Bidding

Participant responses for Incentive/Disincentive (I/D) <u>refuted</u> the following claims:

- I/D often results in utility conflicts
- I/D often results in reduced quality

Specific statements raised contradictory or conflicting attitudes among the participant categories (Designers, Contractors, and Inspectors). Of note, were the following:

- 54% of designers believed I/D results in increased construction costs, while 57% of contractors and 61% of inspectors <u>did not</u> believe so
- 100% of contractors <u>did not</u> believe I/D often results in reduced quality, while 53% inspectors believed it does
- 69% of inspectors and 57% of designers believed I/D increases need for field inspections, while 62% of contractors believed it <u>did not</u>
- 56% of designers and 60% of inspectors believed I/D is best suited for interstate projects, while 54% of contractors <u>did not</u> believe it is
- 53% of designers <u>did not</u> believe I/D is best suited for projects where the safety of road users or construction workers is at risk, while 71% of contractors and 79% of inspectors believed it is

Recurring sentiment regarding advantages and disadvantages are noted in Table 4-5. Where applicable, participant categories are noted.

Table 4-5: Noted Advantages and Disadvantages for Incentive/Disincentive

Advantages	Disadvantages
- Overall, project delivery is expedited and construction days are decreased as the contractor is motivated to finish early - Designers feel contractors are given a positive and negative financial catalyst to complete as early as possible, and provides the contractor (and the team) to recoup additional monies - Contractors feel the motivation with I/D is more effective than either A+B or No Excuse Bonus - Inspectors believed contractors are encouraged to put all their resources to work	- Overall, quality suffers because the contractor is in a rush to complete the work - Designers feel contractors may accept a deficiency in exchange for the financial benefit of the incentive - Inspectors cite the problems with unforeseen conditions, utility conflicts, and inclement weather, and they note the increase in additional costs including contractor claims, inspection costs, and negotiated cost for extra work

Commentary for Incentive/Disincentive includes the effects of expediting time to earn the project bonus. Designers mentioned an increase in CEI costs to meet the rapid construction pace. Contractors also focus on inspection, referencing the shortened inspection duration but stating how there should be no change in the amount of inspection. Inspectors note the likelihood of contractors to reduce quality and cut corners to save time and earn an incentive.

A+B Bidding and Incentive/Disincentive Survey Findings

While not one of the methods specifically inquired about, research has shown the combined use of A+B and Incentive/Disincentive is prevalent in highway construction, and is even more prevalent than the use of A+B by itself.

Participant responses for A+B and Incentive/Disincentive (A+B and I/D) <u>supported</u> the following claims:

- A+B and I/D are more effective when paired together
- A+B and I/D provide greater time savings than A+B alone

Participant responses for A+B and Incentive/Disincentive (A+B and I/D) <u>refuted</u> the following claims:

- A+B and I/D provide greater quality than A+B alone

Specific statements raised contradictory or conflicting attitudes among the participant categories (Designers, Contractors, and Inspectors). Of note, were the following:

- 57% of contractors <u>did not</u> believe it is more effective to pair the two methods together, while 80% of designers and 81% of inspectors believed it is
- 71% of contractors and 57% of designers <u>did not</u> believe A+B and I/D should always be paired together, while 57% of inspectors believed they should
- 67% of contractors <u>did not</u> believe A+B and I/D provide greater cost savings than A+B alone, while 56% of designers and inspectors believed they do

Recurring sentiment regarding advantages and disadvantages are noted in Table 4-6. Where applicable, participant categories are noted.

Table 4-6: Noted Advantages and Disadvantages for A+B and Incentive/Disincentive

Advantages	Disadvantages
- Overall, construction is expedited and project is completed early - Designers felt there was significant time savings - Contractors felt there is greater motivation to accurately bid time and thoroughly consider production rates - Inspectors felt contractors were more competitive in their bidding process and could provide a more accurate project time frame	- Overall, there is increased pressure as well as unrealistic schedules that affect all parties - Designers perceived quality to suffer as time and cost are the contractor's primary focus - Contractors felt I/D should be used sparingly, and that it was not essential to all A+B projects - Inspectors note the unrealistic schedules cause increased contract administration and increased inspection costs

Commentary for A+B and Incentive/Disincentive are limited to only contractor and inspector input. The one contractor comments on how A+B is apparently not their method of choice for any project. Inspectors, however, focus on Incentive/Disincentive and how they are better suited for projects with intermediate or multiple milestones or goals.

Design Build Survey Findings

Participant responses for Design Build (DB) supported the following claims:

- DB has lower cost growth
- DB has faster construction speed
- DB has faster delivery speed
- DB is sensitive to schedule delays
- DB's greatest advantage is time savings
- DB promotes design flexibility
- DB provides contractor flexibility
- DB promotes optimization of project design
- DB promotes optimization of construction methods
- DB reduces the owner's/agency's control of design
- DB increases risk for the design professional
- DB is not ideal for projects with high quantities of right-of-way and utilities
- DB promotes greater familiarity with project contractors than projects obtained through a bidding process

Participant responses for Design Build (DB) refuted none of the proposed claims.

Specific statements raised contradictory or conflicting attitudes among the participant categories (Designers, Contractors, and Inspectors). Of note, were the following:

- 79% of contractors <u>did not</u> believe unit costs are lower, while 52% of designers and 55% of inspectors believed they are

- 67% of contractors <u>did not</u> believe cost growth is lower, while 75% of designers and 61% of inspectors believed it is
- 69% of contractors <u>did not</u> believe DB reduces owner's/agency's control of design, while 62% of designers and 69% of inspectors believed it does
- 65% of designers and 54% of contractors <u>did not</u> believe contract administration is similar, while 69% of inspectors believed it is
- 55% of designers <u>did not</u> believe there is a lower level of contention between the owner and the contractor, while 54% of contractors and 59% of inspectors believed there is
- 71% of designers and 60% of contractors <u>did not</u> believe there is a lower level of contention between the owner and the designer, while 64% of inspectors believed there is

Recurring sentiment regarding advantages and disadvantages are noted in Table 4-7. Where applicable, participant categories are noted.

Table 4-7: Noted Advantages and Disadvantages for Design Build

Advantages	Disadvantages
- Overall, project delivery speed is accelerated, and innovation and creativity are promoted - Designers note improved constructability resulting from greater participant collaboration - Contractors and Inspectors comment on placing the risk/liability on the contractor (instead of the owner), in addition to collaboration between designer and contractor (also reducing the owner's responsibilities	- Overall, issues arise when details are missing from the design documents, or the RFP is not well written and requires time to interpret. Further, the FDOT appears to treat these jobs more like traditional jobs than as DB jobs (i.e., they are overly prescriptive in the design requirements) - Designers highlight the glaring pressures of being caught between the owner and contractor – enduring the most risk, the least rewards, and suffering backlash from construction issues - Contractors believed project risks are not evenly distributed among the parties, and additional risks arise from missing details in the RFPs and design documents - Inspectors believed RFPs must be well written and time must be spent properly interpreting them

Commentary for Design Build mostly discusses the conflicting issues between parties and the owner's (FDOT's) inability to permit design flexibility. Designers mention their conflict in having to satisfy the FDOT and contractors, as well as the ineffectiveness of the method if the owner controls design. Contractors also state the FDOT's inflexibility in interpreting design standards. Inspectors also mirror the sentiment that the FDOT are overly prescriptive.

<u>Interview Results</u>

Based on the interview responses completed by the research participants, the following section offers a synopsis of the prevailing sentiments and provides a supplemental assessment of contracting method performance. The interviews were divided into three parts: the primary interview questions, supplemental FDOT questions, and commentary to refuted literature and/or conflicting issues. The full interview instrument and participant responses are provided in Appendix E, and a review of participant experience is provided in Appendix F. The question responses presented reflect the participants' thoughts and may have been reworded for the sake of brevity or to document prevailing sentiments. Respecting survey participant anonymity, all identifying information has been excluded.

Primary conclusions were based on review of the responses both individually by method, and comparatively to each other. In order to interpret the responses, commentary summations provide a synopsis of key points expressed by the participants, and are given in these formats:

- <u>prevailing sentiments</u>: thoughts expressed by a majority of the respondents; and
- <u>notable remarks</u>: ideas that, while not necessarily recurring throughout the interview process, resonated as pertinent issues that should be taken into consideration

Design Build Interview Findings

Prevailing sentiments:

- Designers, Contractors, and Inspectors all mostly feel the current procurement method of the Design-Builder, is transparent and fair
- Designers feel they are at odds with both the Owner and Contractor due to the nature of the Design-Build team structure
- Time-savings was identified as the best feature of Design Build; however, collaboration and innovation were also among the identified features
- With their prescriptive specifications, and often unclear RFPs, Design Build projects will result in the minimum design requirements
- Concerns exist with the current TRC process: while transparent, the grading process is seen as subjective in nature; also, those performing the reviews are not seen as sufficiently committed to properly review proposals
- Department should provide better assistance in the permitting/ROW process

Notable remarks:

- Design Build is not being used to its fullest extent – wherein the Designers are not provided full range of innovative design capabilities
- With regards to the FDOT's assignment of Design Build projects, it appears to be a means to earmark government funding for jobs that would otherwise have been better suited as traditional projects
- FDOT treats Design Build jobs similarly to DBB – in that the control they wield over design is excessive, and the required percent completion of plans is counterintuitive to the Design Build concept

A+B Bidding Interview Findings

Prevailing sentiments:

- Time-savings was identified as the best feature of A+B bidding; however, concern exists with bidders submitting unrealistically low time bids for the sole purpose of winning the project – the resulting problems of which include time extensions, added claims, and increased costs associated with having to rush construction to meet the already unrealistic deadlines

Notable remarks:

- There appears to be conflict in the award of extra time: with reports of willingness on the part of the FDOT to award time extensions after bidders setting unrealistic bid times, and reported issues with not receiving time extensions for unknown conditions (i.e., utilities and groundwork) and uncontrollable events (i.e., weather and holidays)

No Excuse Bonus Interview Findings

Prevailing sentiments:

- Designers, Contractors, and Inspectors all preferred the use of smaller, graduated bonuses as opposed to larger, single bonuses – permitting several opportunities to incentivize construction while deterring contractors from focusing all resources on a single portion and neglecting other portions
- Concerns exist when contractors realize they will not meet the deadline – at which point they pull their resources and reduce their efforts

Notable remarks:

- Reported lack of enforcement: "No Excuse" is often not, in fact, "No Excuse"; bonus may be awarded even if deadline not met
- For bonus jobs (NEB and I/D alike), there exists a mentality among contractors that they are entitled to the bonus: as funds are allocated for a project with the intent of being paid out as a bonus, if the deadline is not met and the bonus not awarded, claims will certainly be filed, and the funds will essentially be used to pay off the claims
- Overall, commitment issues: FDOT needs to stick to "no excuses" and not be afraid of pulling bonuses if deadlines are not met

Incentive/Disincentive Interview Findings

Prevailing sentiments:

- Incentives are regarded by Designers, Contractors, and Inspectors alike as an effective motivation tool for completing projects by the established deadline
- Contractors have noted that incentives should be increased to be better balanced with the disincentives – it should be worth the contractor's costs of increasing their effort

Notable remarks:

- (As with NEB) Mentality exists with contractors that as bonuses are already earmarked by the FDOT for the project, they are entitled to the funds – so if the deadline is not met they file claims, and as has been the case, the FDOT will often pay off the claims using these funds
- Incentives are targeted solely at the contractor … as such other parties have no motivation to assist in increasing construction efforts. It is suggested to offer incentives to CEIs, designers, utility subcontractors, etc.

Lump Sum Interview Findings

Prevailing sentiments:

- Streamlined process (with reduced time and reduced design efforts) is noted among the best features of Lump Sum
- Designers, Contractors, and Inspectors all emphasize the importance of concise and complete plans as well as a well-defined project scope

Notable remarks:

- Difficulty in adding and/or removing work under Lump Sum contracts, and difficulty in quantifying and calculating prices for these added elements
- Confusion still exists within the industry in differentiating Lump Sum as a contracting method and lump sum as a payment option

Overall Interview Findings

Certain sentiments expressed by the interview participants stood out as being particularly noteworthy, and appeared to be completely independent of the alternative contracting method in question. Following are some of the prominent opinions:

- Design specifications, RFPs, and project scope should be well-defined and free of errors and omissions
- Department should provide better assistance for projects where permitting, utility, and ROW issues exist

Interview participants were also all asked what the determining factor is when selecting the contracting method being used. This question was asked in all sections, ensuring at least one response from the interview participant. Following are some of the prevailing answers:

- Designers felt factors such as project size, scope, and complexity determine the contracting method being used
- Inspectors felt factors such as permitting, utilities, ROW, and environmental issues determine the contracting method being used
- Contractors felt factors such as timeframe and public need/impact/benefit
- Several respondents expressed the decision to select a particular method was made at the discretion of the owner, and oftentimes not based on any particular project characteristic

Observational Interview Analysis

The following section illustrate the trends in response to specific interview questions. These questions were selected because of their ability to observe definite views on the part of the respondents that can be compared between categories for the contracting methods. The responses shown reflect specific opinions to questions that assess performance of the methods (either in Yes/No format, or by means of identifying specific individuals), and the questions selected were those that queried approval of the individual methods themselves.

Table 4-8 lists the exact questions that shall be analyzed in the graphs that follow. The selection of these questions was based on how well the method is received; if the method is viewed as successful; if the respondent feels FDOT is using the method to its fullest; and if the respondents observe other parties as having difficulty with the contracting method. Finding response trends to these questions will help determine general sentiment in the following four evaluative categories:

- Approval of the methods
- Assessment of the methods
- Perceived performance, on the FDOT's part, with employing the methods
- Perceived capability, on other project participants' part, with utilizing the methods

Table 4-8: Selected Questions for Observational Analysis and Corresponding Evaluative Categories

Question Statement	Evaluative Category
In your opinion, do you like ___?	Approval
Would you consider ___ a successful contracting method, as currently being used by FDOT?	Assessment
Is Florida using ___ to its greatest potential?	Performance
Do all participating parties (owners/designers/contractors) work well under ___?	Capability
Is there one party that stands out as having the most conflict/difficulty with the method?	Capability

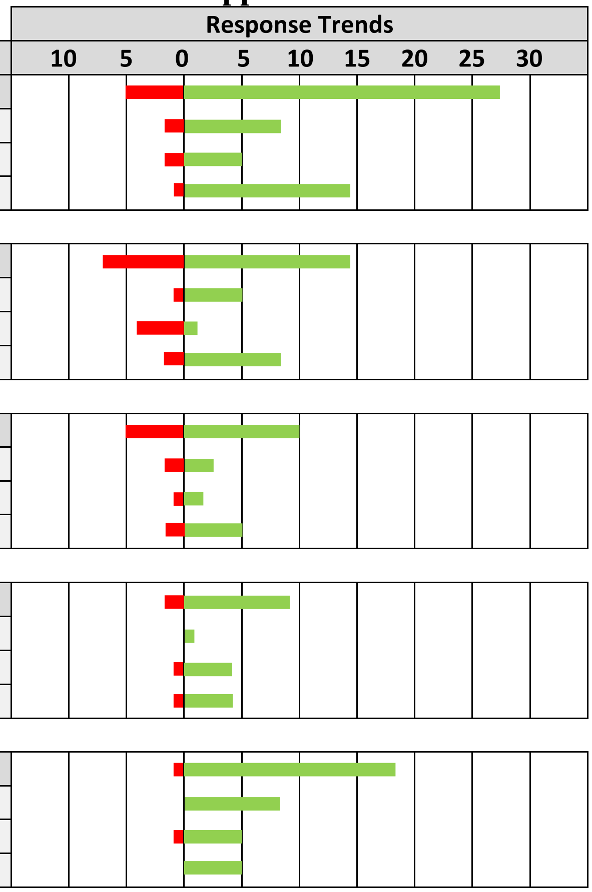
The tables that follow illustrate response trends for the individual questions (whether in the affirmative or not). It should be noted there are a far greater number of responses for the Design Build and Lump Sum-based questions than for the other three methods (A+B, No Excuse Bonus, and I/D), indicative of the greater level of experience the industry has with these two methods, and demonstrative that the conclusions drawn for these two method are more reliable than those drawn for the remaining three.

The first evaluative category is Approval. Here, participants were asked if, in their personal opinion, they liked the alternative contracting method in question. Analysis of this question will attempt to demonstrate if, and which, individuals are partial towards specific methods. While the question of liking a method is purely subjective, the responses could be indicative of a method's industry-wide reception – which in the case of newer alternative contracting methods could underline administrative performance issues. Further, those that prefer a specific method may be more likely to work with participants to ensure the successful completion of a project, hence identifying methods that are disapproved will aid in targeting departmental improvement efforts.

Looking at Table 4-9 on the following page, regarding method approval, the majority of all respondents (or all categories of participants) generally like the alternative contracting methods in question. Of the five contracting methods, Lump Sum has the highest approval percentage, with 95% of respondents replying YES. Subsequently, A+B and No Excuse Bonus have the lowest approval percentages, with 67% of respondents for each. Of the different respondent categories, I/D had 100% approval from Designers, while Lump Sum also had 100% approval from both Designers and Inspectors. Also of note, the only respondent category to show a majority disapproval rating for a specific contracting method was Contractors for A+B bidding.

Table 4-9: Response Trends for Method Approval

Question Summary	Respondent	No	Yes
Do you like Design Build?		5	27
	Designers	2	8
	Contractors	2	5
	Inspectors	1	14
Do you like A+B?		7	14
	Designers	1	5
	Contractors	4	1
	Inspectors	2	8
Do you like No Excuse Bonus?		5	10
	Designers	2	3
	Contractors	1	2
	Inspectors	2	5
Do you like I/D?		2	9
	Designers		1
	Contractors	1	4
	Inspectors	1	4
Do you like Lump Sum?		1	18
	Designers		8
	Contractors	1	5
	Inspectors		5

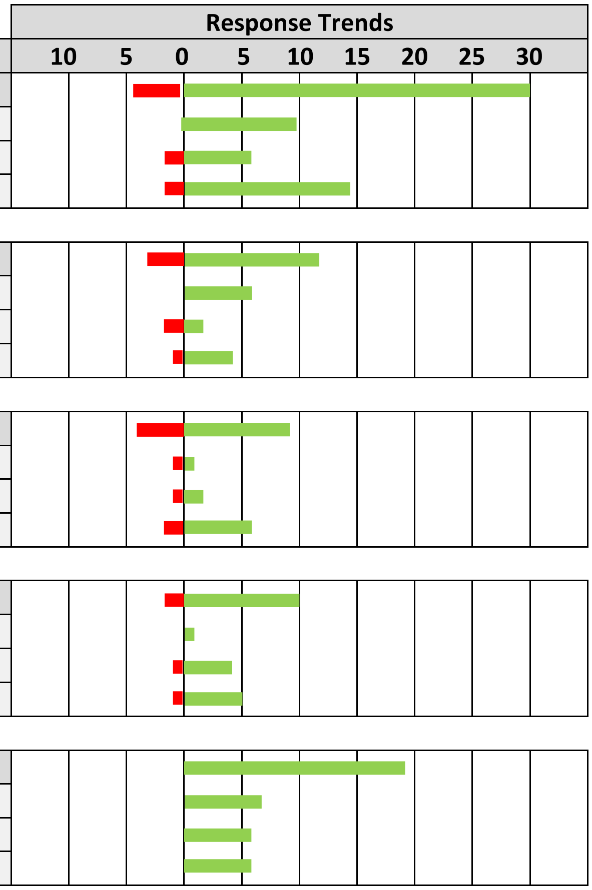


The second evaluative category is Acceptance. Here, participants were asked if they felt the alternative contracting in question was being used successfully. Analysis of this question will help in eliminating personal bias on the part of the respondent – as individuals that previously gave poor "approval" ratings may still acknowledge that specific method's ability to garner results.

Looking at Table 4-10 on the following page, regarding method acceptance, the majority of all respondents (or all categories of participants) feel the alternative contracting methods are being used successfully. Of the five contracting methods, Lump Sum has the highest acceptance percentage, with 100% of respondents replying YES. Subsequently, No Excuse Bonus has the lowest acceptance percentage, with 69%. Of the different respondent categories, Design Build, A+B, and I/D all had 100% acceptance from Designers, while Lump Sum had 100% acceptance from Designers, Contractors, and Inspectors.

Table 4-10: Response Trends for Method Assessment

Question Summary	Respondent	No	Yes
Is Design Build being used successfully?		**4**	**30**
	Designers		10
	Contractors	2	6
	Inspectors	2	14
Is A+B being used successfully?		**3**	**12**
	Designers		6
	Contractors	2	2
	Inspectors	1	4
Is No Excuse Bonus being used successfully?		**4**	**9**
	Designers	1	1
	Contractors	1	2
	Inspectors	2	6
Is I/D being used successfully?		**2**	**10**
	Designers		1
	Contractors	1	4
	Inspectors	1	5
Is Lump Sum being used successfully?		**0**	**19**
	Designers		7
	Contractors		6
	Inspectors		6



The third evaluative category is Performance. Here, participants were asked if they felt the FDOT was employing the alternative contracting in question to its fullest potential. Analysis of this question will help identify administrative setbacks that, at least in the eyes of the interview respondent, should be addressed to maximize success with project administration.

Looking at Table 4-11 on the following page, regarding the FDOT's method performance, most respondents felt Lump Sum was seen as being used to its greatest potential, whereas most respondents felt No Excuse Bonus and I/D were not being used to their greatest potential. With Design Build and A+B, the respondents appeared to be close to even. Of the contracting methods, Lump Sum was seen as being used to the fullest, with 79% of respondents replying YES. Subsequently, No Excuse Bonus was seen as being used to its least potential, with only 13%. Of the different respondent categories, no one category felt any of the methods was, 100%, being used to its fullest. In contrast, 100% of Designers and Contractors felt No Excuse Bonus was not being used to its greatest potential, and 100% of Inspectors felt I/D was not being used to its greatest potential.

Table 4-11: Response Trends for FDOT Performance

Question Summary	Respondent	No	Yes	Response Trends
				10 5 0 5 10 15 20 25 30
Is FDOT using Design Build to its greatest potential?		**10**	**19**	
	Designers	4	6	
	Contractors	1	5	
	Inspectors	5	8	
Is FDOT using A+B to its greatest potential?		**4**	**7**	
	Designers	1	1	
	Contractors	2	1	
	Inspectors	1	5	
Is FDOT using No Excuse Bonus to its greatest potential?		**7**	**1**	
	Designers	1		
	Contractors	2		
	Inspectors	4	1	
Is FDOT using I/D to its greatest potential?		**6**	**1**	
	Designers			
	Contractors	3	1	
	Inspectors	3		
Is FDOT using Lump Sum to its greatest potential?		**4**	**15**	
	Designers	1	6	
	Contractors	2	3	
	Inspectors	1	6	

The fourth evaluative category is Capability. Here, participants were asked if they felt all parties work well together, and if their fellow project participants (owners, designers, contractors, CEIs, etc.) appeared to be having conflict or difficulty with any of the alternative contracting methods in question. Analysis of this question will help identify methods that potentially have disconnect between the parties – as poor performance by any one party can significantly affect the performance of the other parties and, hence, the overall completion and performance of the project itself.

Looking at Table 4-12 on the following page, regarding participant capabilities, the majority of respondents think all participating parties work well together for the alternative contracting methods in question. Of the five contracting methods, participants are seen as working best together under No Excuse Bonus, with 92% of respondents saying YES. Conversely, participants are seen as working the least together under Design Build, with 59%. Of the different respondent categories, 100% of Designers and Inspectors feel all work well under No Excuse Bonus; 100% of Inspectors feel all work well under I/D; and 100% of Inspectors feel all work well under Lump Sum.

Regarding the specific parties which the respondents feel have the most difficulty, Contractors appear to be the most often identified party.

Table 4-12: Response Trends for Participant Capability and Conflicting Party

Question Summary	Respondent	No	Yes	Response Trends 10 5 0 5 10 15	Conflicted Party
Do all parties work well under Design Build?		**9**	**13**		**Designer**
	Designers	4	3		Contractor
	Contractors	2	3		Owner
	Inspectors	3	7		Designer
Do all parties work well under A+B?		**5**	**9**		**Contractor**
	Designers	1	1		Contractor
	Contractors	3	1		Owner
	Inspectors	1	7		Contractor
Do all parties work well under No Excuse Bonus?		**1**	**11**		**Contractor**
	Designers		3		Owner
	Contractors	1	1		*(none)*
	Inspectors		7		Contractor
Do all parties work well under I/D?		**1**	**8**		**Inspector**
	Designers				Designer
	Contractors	1	3		Inspector
	Inspectors		5		*(all)*
Do all parties work well under Lump Sum?		**4**	**12**		**Owner**
	Designers	2	4		Contractor
	Contractors	2	2		Inspector
	Inspectors		6		Owner

Cost and Time Performance Analysis Results

Based on the data obtained from the FDOT database, the following section offers a summation of the findings, including average time and cost savings, time performance, cost performance, and quality assessment. Analysis was divided into three parts: cost savings breakdown, time savings breakdown, and quality performance breakdown. Full lists of project data, analyses, and supplemental calculations (such as the investigation of statistical outliers) are provided in Appendices G-K.

Regarding calculation interpretations for time savings (based on the equations presented in Chapter 3), the following should be noted:

- negative "percentage change of days used over current" represents a positive savings in contract days (with a corresponding positive average days saved per project)
  - i.e., negative time values suggest average and percentage time saved
- positive "percentage change of days used over current" represents a negative savings in contract days (with a corresponding negative average days saved per project)
  - i.e., positive time values reflect average and percentage time delays

Likewise, calculation interpretations for cost savings (based on the equations presented in Chapter 3), the following should be noted:

- negative "percentage change of actual over current cost" represents a positive savings in costs (with a corresponding positive average costs saved per project)
    - negative cost values (in parentheses) represent average and percentage cost saved
- positive "percentage change of actual over current cost" represents a negative savings in costs (with a corresponding negative average costs saved per project, as identified by parentheses)

It will be noted throughout, for analyzed categories having fewer than five projects the research team refrained from making any interpretations. And while no significant conclusions could be drawn from the analyzed categories having too few projects, the calculations are presented for the benefit of observation.

Presented in Table 4-15 is a comprehensive cost analysis summary for all contracting methods as broken up by cost categories. In this extended format, and further simplified in Table 4-13, it can be observed how project cost categories influence the project costs. For projects under $1 million and between $1 and $5 million, all of the contracting methods, including Design Bid Build, have a greater majority of the projects experience cost savings. Savings here include projects finishing under and at cost.

Table 4-13: Percentage of Projects Experiencing Cost Savings or Cost Overruns

Delivery Method	Under $1M	$1M-$5M	$5M-$10M	$10M-$20M	Above $20M
DBB	88% ↓	68% ↓	54% ↑	67% ↑	77% ↑
DB (Min)	80% ↓	73% ↓	91% ↓		
DB (Maj)	87% ↓	74% ↓	60% ↓	75% ↑	59% ↑
LS	97% ↓	61% ↓	65% ↓	63% ↓	
I/D	75% ↓	61% ↓	69% ↑	80% ↑	
A+B		67% ↓		100% ↑	67% ↓
NEB		60% ↓			

Where cost savings were incurred, the symbol (↓) is shown accompanying the percentage of projects experience the savings; and where cost increases were incurred, the symbol (↑) is shown accompanying the percentage of projects experiencing the increase.

As the overall costs increase for the project (often denoting greater scope, complexity, and/or effort and coordination on the part of the contractor) a greater percentage of the projects experience cost overruns as illustrated in Figure 4-3. This appears to happen for most alternative contracting methods greater than $5 to $10 million. The exception lies with A+B which demonstrates a greater majority of projects experiencing savings for projects over $20 million.

Presented in Table 4-16 is a comprehensive time analysis summary for all contracting methods as broken up by cost categories. In this extended format, and further simplified in Table 4-14, it can be seen how all contracting methods, including Design Bid Build, were within schedule.

Table 4-14: Percentage of Projects Finishing Early or On Time

Delivery Method	Under $1M	$1M-$5M	$5M-$10M	$10M-$20M	Above $20M
DBB	96% ↓	95% ↓	96% ↓	91% ↓	94% ↓
DB (Min)	92% ↓	86% ↓	72% ↓		
DB (Maj)	99% ↓	78% ↓	90% ↓	91% ↓	100% ↓
LS	93% ↓	92% ↓	94% ↓	100% ↓	
I/D	100% ↓	92% ↓	92% ↓	100% ↓	
A+B		100% ↓		100% ↓	100% ↓
NEB		100% ↓			

Where time savings were incurred, the symbol (↓) is shown accompanying the percentage of projects experience the savings; and where schedule increases were incurred, the symbol (↑) is shown accompanying the percentage of projects experiencing the increase.

Table 4-15: Cost Analysis Summary for Contracting Method by Cost Category

Delivery Method	Above $20 Million							$10 to $20 Million							$5 to $10 Million							$1 to $5 Million							Under $1 Million						
	Tot.	Under Cost		At Cost		Over Cost		Tot.	Under Cost		At Cost		Over Cost		Tot.	Under Cost		At Cost		Over Cost		Tot.	Under Cost		At Cost		Over Cost		Tot.	Under Cost		At Cost		Over Cost	
DBB	**30**	7	23%	0	0%	23	77%	**63**	21	33%	0	0%	42	67%	**135**	62	46%	0	0%	73	54%	**658**	447	68%	1	0%	210	32%	**609**	530	87%	9	1%	70	11%
DB (Min.)	**3**	0	0%	0	0%	3	100%	**3**	3	100%	0	0%	0	0%	**11**	10	91%	0	0%	1	9%	**45**	32	71%	1	2%	12	27%	**85**	40	47%	28	33%	17	20%
DB (Maj.)	**22**	9	41%	0	0%	13	59%	**12**	3	25%	0	0%	9	75%	**10**	6	60%	0	0%	4	40%	**27**	20	74%	0	0%	7	26%	**15**	9	60%	4	27%	2	13%
LS	**1**	1	100%	0	0%	0	0%	**8**	5	63%	0	0%	3	38%	**31**	20	65%	0	0%	11	35%	**205**	123	60%	3	1%	79	38%	**357**	323	90%	26	7%	8	2%
I/D	**3**	1	33%	0	0%	2	67%	**5**	1	20%	0	0%	4	80%	**13**	4	31%	0	0%	9	69%	**36**	22	61%	0	0%	14	39%	**16**	12	75%	0	0%	4	25%
A+B	**6**	3	50%	1	17%	2	33%	**6**	0	0%	0	0%	6	100%	**3**	0	0%	0	0%	3	100%	**6**	4	67%	0	0%	2	33%	**0**	-	-	-	-	-	-
NEB	**1**	0	0%	0	0%	1	100%	**2**	1	50%	0	0%	1	50%	**4**	0	0%	0	0%	4	100%	**5**	3	60%	0	0%	2	40%	**0**	-	-	-	-	-	-

Table 4-16: Time Analysis Summary for Contracting Method by Cost Category

Delivery Method	Above $20 Million							$10 to $20 Million							$5 to $10 Million							$1 to $5 Million							Under $1 Million						
	Tot.	Early		On Time		Late		Tot.	Early		On Time		Late		Tot.	Early		On Time		Late		Tot.	Early		On Time		Late		Tot.	Early		On Time		Late	
DBB	**30**	17	57%	11	37%	2	7%	**63**	25	40%	32	51%	6	9%	**135**	72	54%	57	42%	6	4%	**658**	339	52%	286	43%	33	5%	**609**	304	50%	281	46%	24	4%
DB (Min.)	**3**	3	100%	0	0%	0	0%	**3**	1	33%	1	33%	1	33%	**11**	4	36%	4	36%	3	27%	**45**	19	42%	20	44%	6	13%	**85**	44	52%	34	40%	7	8%
DB (Maj.)	**22**	11	50%	11	50%	0	0%	**12**	7	58%	4	33%	1	8%	**10**	3	30%	6	60%	1	10%	**27**	10	37%	11	41%	6	22%	**15**	9	60%	5	33%	1	7%
LS	**1**	1	100%	0	0%	0	0%	**8**	3	38%	5	63%	0	0%	**31**	16	52%	13	42%	2	6%	**205**	102	50%	87	42%	16	8%	**357**	198	55%	137	38%	22	6%
I/D	**3**	2	67%	1	33%	0	0%	**5**	4	80%	1	20%	0	0%	**13**	10	77%	2	15%	1	8%	**36**	28	78%	5	14%	3	8%	**16**	14	88%	2	13%	0	0%
A+B	**6**	4	67%	2	33%	0	0%	**6**	6	100%	0	0%	0	0%	**3**	2	67%	0	0%	1	33%	**6**	2	33%	4	67%	0	0%	**0**	-	-	-	-	-	-
NEB	**1**	1	100%	0	0%	0	0%	**2**	2	100%	0	0%	0	0%	**4**	3	75%	1	25%	0	0%	**5**	5	100%	0	0%	0	0%	**0**	-	-	-	-	-	-

Table 4-17: Time and Cost Savings Analysis Summary for Contracting Methods by Cost Category

Delivery Method	Above $20 Million					$10 to $20 Million					$5 to $10 Million					$1 to $5 Million					Under $1 Million				
		Time		Cost			Time		Cost			Time		Cost			Time		Cost			Time		Cost	
	Tot.	%Δ Days	Avg Days Saved	%Δ Cost	Avg Cost Saved	Tot. w/o outl.	%Δ Days	Avg Days Saved	%Δ Cost	Avg Cost Saved	Tot.	%Δ Days	Avg Days Saved	%Δ Cost	Avg Cost Saved	Tot.	%Δ Days	Avg Days Saved	%Δ Cost	Avg Cost Saved	Tot.	%Δ Days	Avg Days Saved	%Δ Cost	Avg Cost Saved
DBB	**30**	-3.0%	28.7	3.7%	($1,317,046)	**63**	-0.2%	1.4	1.4%	($178,909)	**135**	-1.9%	8.3	-0.6%	$41,317	**658**	-2.2%	6	-1.9%	$45,641	**609**	-2.1%	3	-4.9%	$22,816
DB (Min.)	**3**	-0.2%	2	1.4%	($436,072)	**3**	3.8%	-28.3	-1.2%	$136,399	**11**	1.6%	-9.8	-2.0%	$126,084	**45**	-0.6%	2.2	-0.5%	$9,831	**85**	-5.2%	9.8	-2.6%	$9,698
DB (Maj.)	**22**	-3.0%	27.3	2.6%	($1,469,581)	**12**	-0.5%	3.9	1.5%	($209,815)	**10**	0.3%	-2	-0.6%	$42,873	**27**	2.8%	-11	-1.3%	$30,102	**15**	-6.5%	16.7	-3.9%	$19,197
LS	**1**	-0.3%	2	-8.3%	$2,079,629	**8**	-4.4%	19.6	-0.7%	$98,085	**31**	-2.1%	5.4	0.1%	($6,744)	**205**	-2.2%	4.2	-0.2%	$3,871	**357**	-2.6%	2.4	-4.3%	$14,765
I/D	**3**	-7.0%	88.7	3.8%	($2,278,408)	**5**	-14.7%	95	5.5%	($774,658)	**13**	-11.8%	55.4	2.9%	($203,315)	**36**	-8.3%	21.8	-1.8%	$49,865	**16**	-15.2%	21.4	-4.4%	$29,018
A+B	**6**	-5.2%	43.7	3.4%	($1,035,405)	**6**	-17.1%	97.8	4.5%	($709,287)	**3**	-10.2%	23.3	14.9%	($1,168,445)	**6**	-0.2%	0.3	2.2%	($50,900)	**0**	-	-	-	-
NEB	**1**	-21.3%	250	2.6%	($660,372)	**2**	-1.3%	10	-0.6%	$89,565	**4**	-3.5%	12.3	4.0%	($315,778)	**5**	-21.3%	55.2	-1.7%	$59,037	**0**	-	-	-	-

where: %Δ Days = % Change of Days Used / Current

% Δ Cost = % Change of Actual / Current Cost

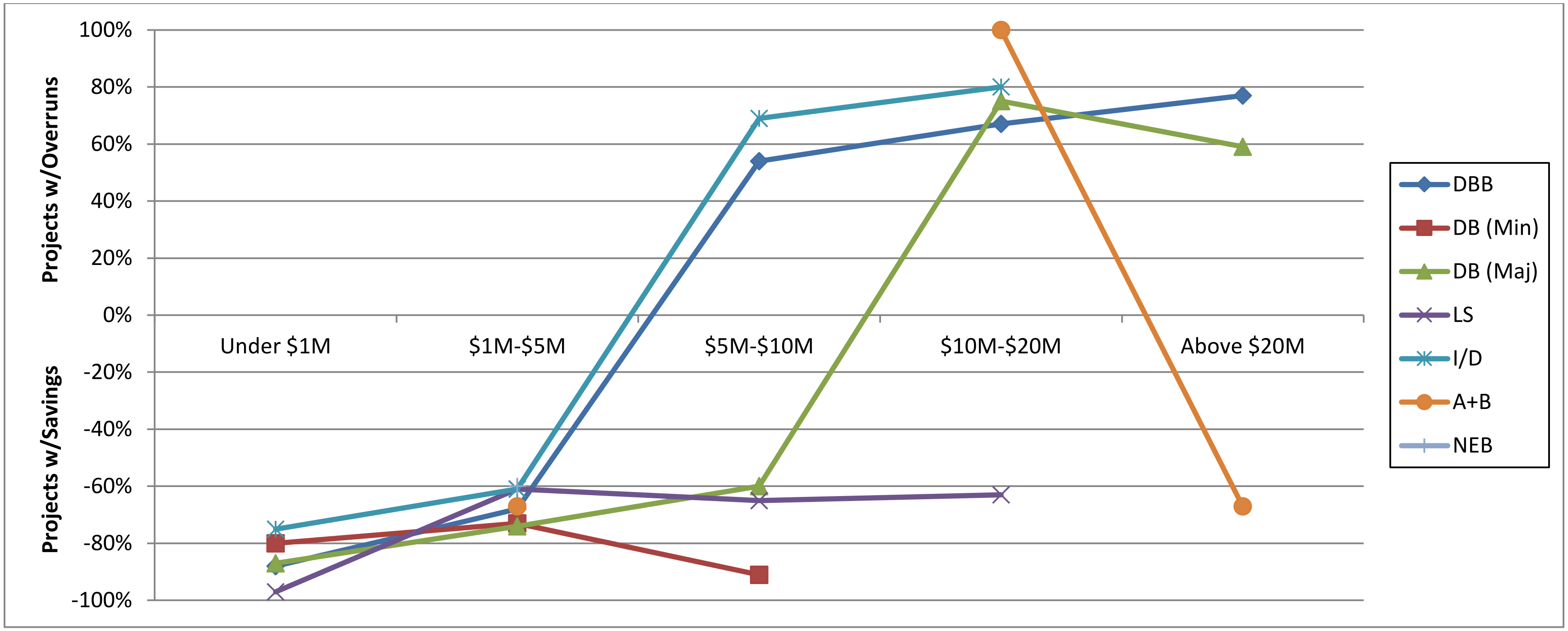


Figure 4-3: Percentage of Projects Experiencing Cost Savings or Cost Overruns

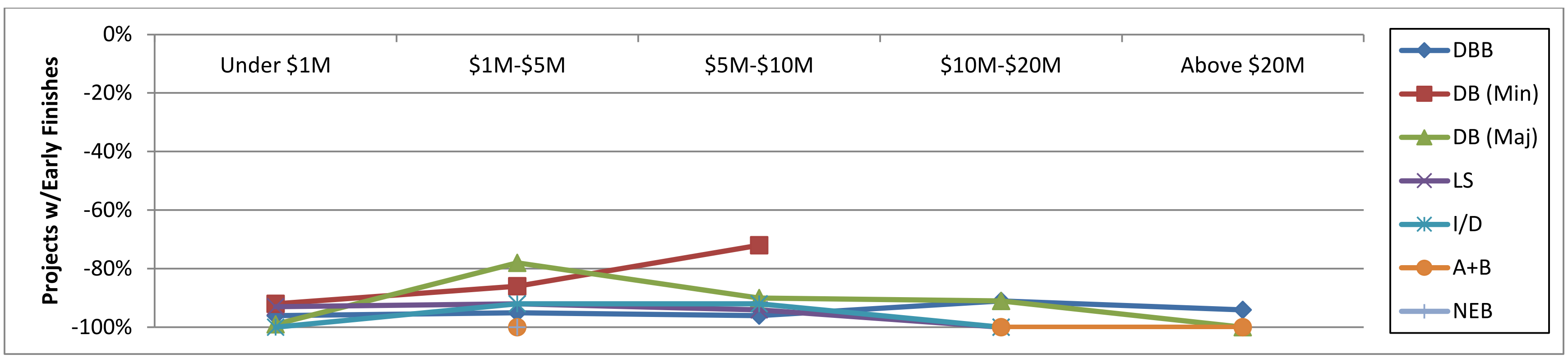


Figure 4-4: Percentage of Projects Finishing Early or On Time

Increase in project costs do not appear to influence the schedule of the contracting methods, as illustrated in Figure 4-4, with perhaps the exception of Design Build (Minor) whose percentage of projects finishing early or on time seems to decrease with increase in project cost.

Presented in Table 4-17 is a comprehensive cost and time savings analysis summary for all contracting methods as broken up by cost categories. In this extended format, and further simplified in Tables 4-18 and 4-19, it can be observed how (at least for Design Bid Build, Design Build (Major), Incentive/Disincentive, and A+B) the average costs saved decreases as project costs increase. Illustrated in Figure 4-5, the costs decrease so much so that they become additional costs the contractor must now incur to finish the job.

Regarding average days saved, from Figure 4-6, most contracting methods experience an increase in days saved as project costs increase, with the exception of A+B and Design Build (Minor) that decreased with increased project costs. Design Bid Build and Design Build (Major) seem to fluctuate between savings and schedule overruns.

Table 4-18: Average Costs Saved per Project

Delivery Method	Under $1M	$1M-$5M	$5M-$10M	$10M-$20M	Above $20M
DBB	$22,816	$45,641	$41,317	($178,909)	($1,317,046)
DB (Min)	$9,698	$9,831	$126,084		
DB (Maj)	$19,197	$30,102	$42,873	($209,815)	($1,469,581)
LS	$14,765	$3,871	($6,744)	$98,085	
I/D	$29,018	$49,865	($203,315)	($774,658)	
A+B		($50,900)		($709,287)	($1,035,405)
NEB		$59,037			

Table 4-19: Average Days Saved per Project

Delivery Method	Under $1M	$1M-$5M	$5M-$10M	$10M-$20M	Above $20M
DBB	3	6	8.3	1.4	28.7
DB (Min)	9.8	2.2	-9.8		
DB (Maj)	16.7	-11	-2	3.9	27.3
LS	2.4	4.2	5.4	19.6	
I/D	21.4	21.8	55.4	95	
A+B		0.3		97.8	43.7
NEB		55.2			

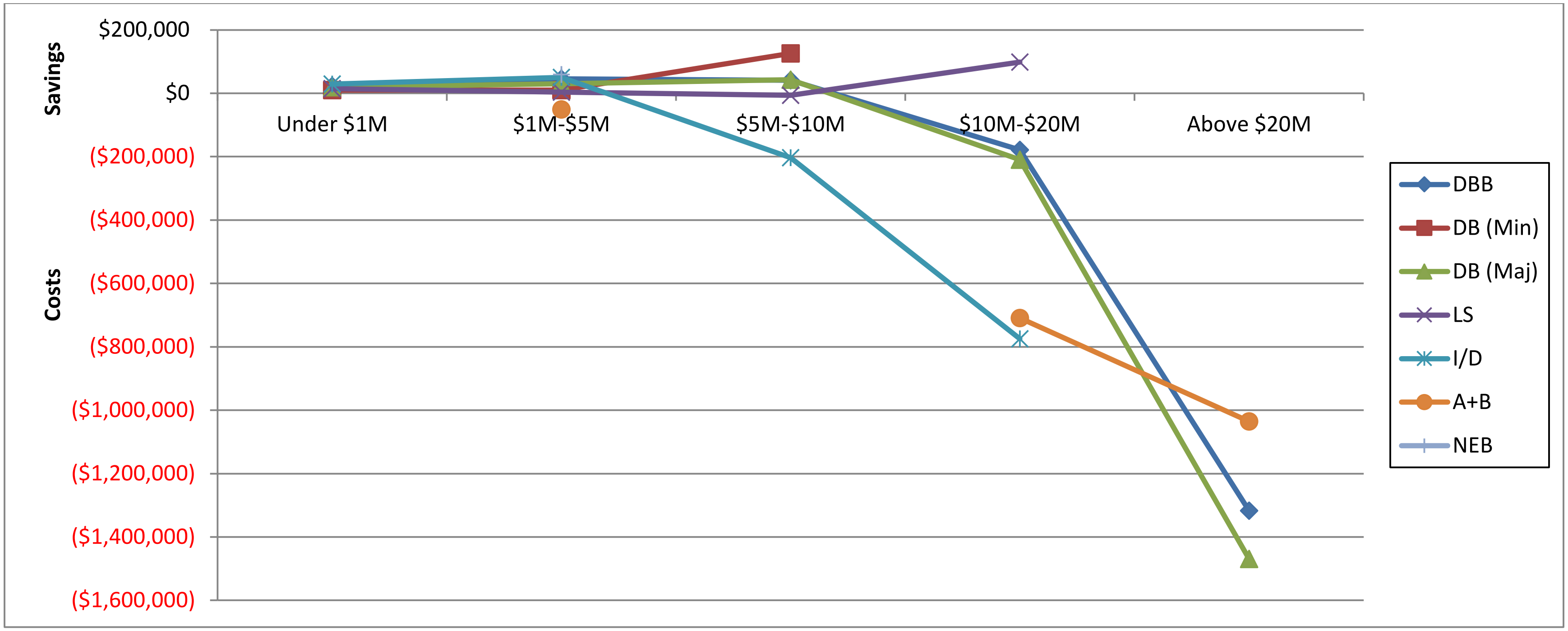


Figure 4-5: Average Costs Saved per Project

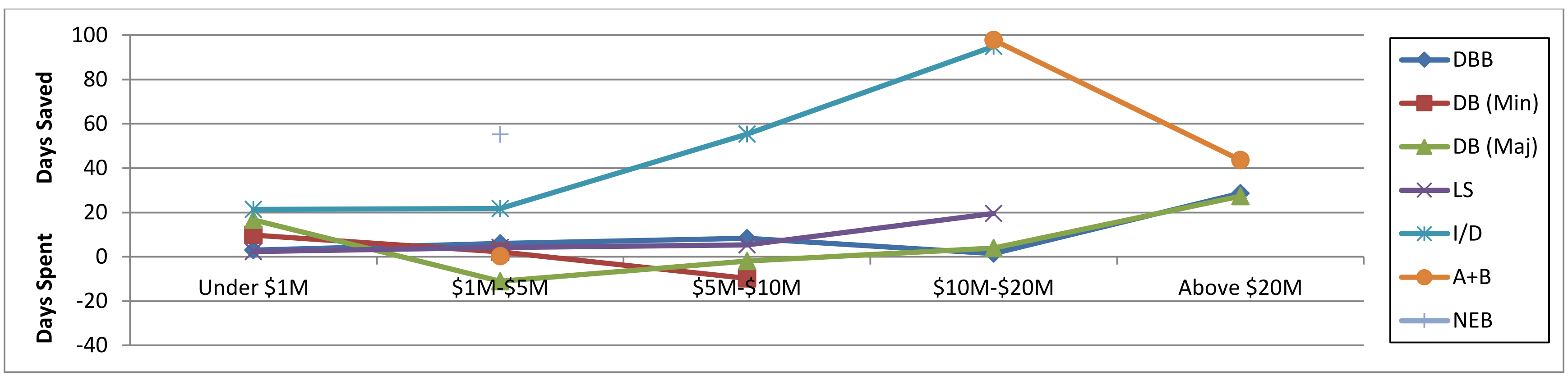


Figure 4-6: Average Days Saved per Project

<u>Quality Performance Analysis Results</u>
Based on the overall CPPR scores available from the Quality Dataset, the mean, mode, and median scores were calculated for the contracting methods. Table 4-20 presents the average CPPR scores for the 2,361 projects. As explained in Chapter 3, the Quality Dataset excluded projects with zero scores as outliers. This outlier assumption was confirmed by the FDOT, noting that overall scores of zero are not indicative of poor performance but likely incorrect data entry.

Table 4-20: Overall CPPR Calculations for Quality Dataset

Project Delivery Method	Total Analyzed Projects	CPPR Mean	CPPR Mode	CPPR Median
Design Bid Build	1,458	96.9	98	98
DB (Minor)	146	97.4	98	98
DB (Major)	79	97.8	100	100
Lump Sum	578	96.5	98	98
Incentive/Disincentive	71	98.8	104	103
A+B	19	101.5	104	103
No Excuse Bonus	10	100.4	100	100
Total:	2,361			

From the table, the averages range between upper 90s and lower 100s, and Lump Sum is seen as having the lowest average value (96.5). A+B had the highest average value (101.5).

Figure 4-7 provides illustration of Table 4-20. As evident in the graph, Design Bid Build is surpassed by all delivery systems with the exception of Lump Sum. Additionally, Design Build (Minor) and Design Build (Major) had comparable values to Design Bid Build, while Incentive/Disincentive, A+B, and No Excuse Bonus had significantly higher values compared to Design Bid Build.

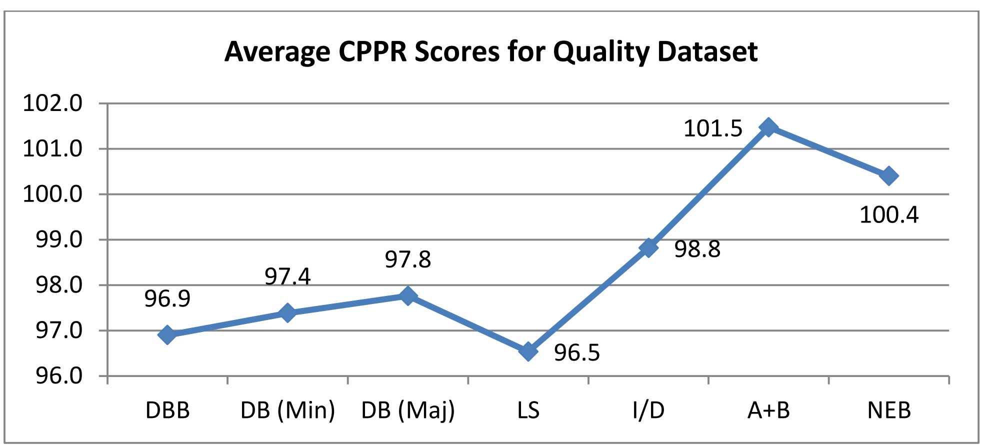


Figure 4-7: Average CPPR Scores for Quality Dataset

Investigating the limited projects that contained CPPR subscores for Category 5 and Category 8 (which comprised of 1,038 projects from within the Quality Dataset), first the overall CPPR means, modes, and medians were calculated. Table 4-16 presents the values for this CPPR Subset. As the collection of the individual category subscores is a relatively new practice for the FDOT, this CPPR Subset comprises more recent projects as compared to those within the Quality Dataset.

Table 4-21: CPPR Calculations for CPPR Subset

Project Delivery Method	Total Analyzed Projects	CPPR Mean	CPPR Mode	CPPR Median
Design Bid Build	689	96.5	98	98
DB (Minor)	60	98.2	104	99.5
DB (Major)	22	99.0	100	100
Lump Sum	264	95.7	98	98
Incentive/Disincentive[+]	3	103.3	104	104
A+B	-	-	-	-
No Excuse Bonus	-	-	-	-
Total:	1038			

From the table, the averages range between mid-90s and lower 100s, and Lump Sum is once again seen as having the lowest average value (95.7). Incentive/Disincentive had the highest average value (103.3). Figure 4-8 provides illustration of Table 4-21. As evident in the graph, Design Bid Build is surpassed by all delivery systems except for Lump Sum. Additionally, Design Build (Minor) and Design Build (Major) are higher than Design Bid Build. And while Incentive/Disincentive is significantly higher, as there were only three projects, any interpretations here cannot be adequately justified.

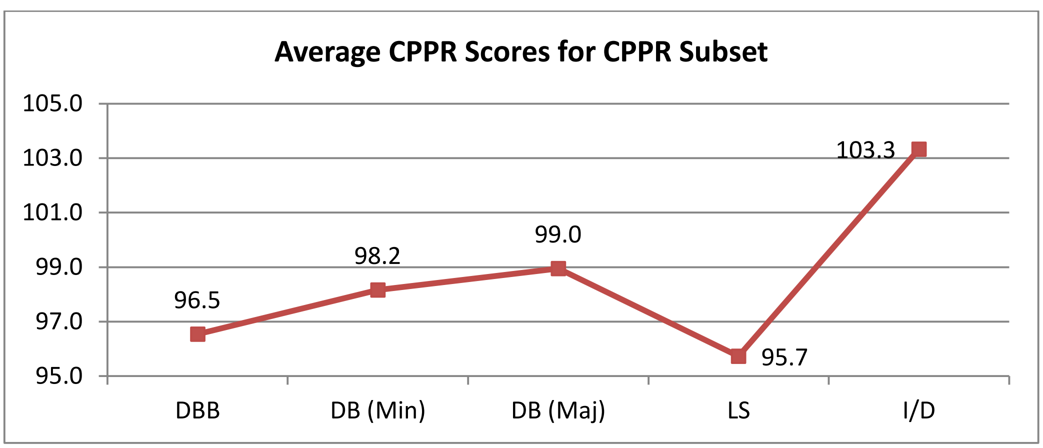


Figure 4-8: Average CPPR Scores for CPPR Subset

Figure 4-9 provides a comparison of both the CPPR Subset and the Quality Dataset. For the most part, the subset follows the same trends as all the analyzed projects, with Lump Sum being lower than Design Bid Build on both accounts, and Incentive/Disincentive being much higher than Design Bid Build on both accounts. The only notable difference is Design Bid Build and

Lump Sum having lower overall average scores under the more recent subset than the older (and larger) set.

For the most part, it also appears that the CPPR Subset had higher average scores than the larger (and older) Quality Dataset of projects. As the subset comprises a more recent set of projects, it can be assumed that with increased usage of the newer project delivery systems, contractors over time have become more proficient in the nuances of the specific methods. Also, the newer, more detailed collection of CPPR subscores appears to show the FDOTs increased interest in the value and significance of these ratings, resulting in contractors making more of an effort to earn higher scores and, thus, increase their likelihood of continued selection for future construction projects. And as noted before, A+B and No Excuse Bonus are not represented in the subset of projects, however if more data were available, and the current trends continue, they would be expected to perform significantly higher than Design Bid Build.

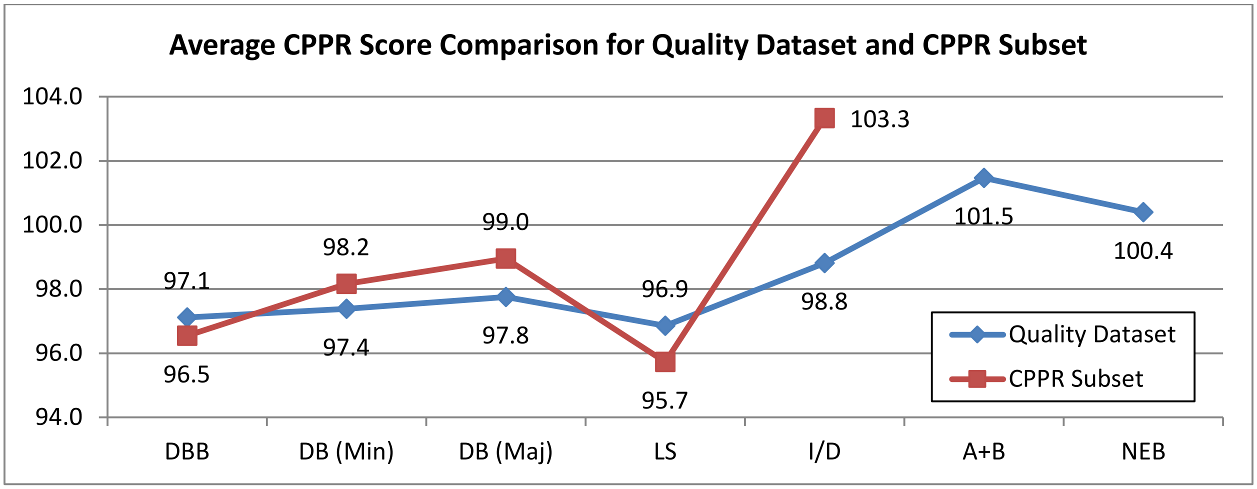


Figure 4-9: Average CPPR Score Comparison for Quality Dataset and CPPR Subset

Table 4-22 shows the average subscores for Categories 5 and 8 (from the CPPR Subset) while also showing the average number of deficiency letters and the average percentage work quality for the CPPR Subset. From the numbers, Design Build (Major) has the lowest subscore average for Category 5, while Incentive/Disincentive has the highest subscore average for Category 5. In contrast, Design Build (Major) has the highest subscore average for Category 8, while Lump Sum has the lowest subscore average for Category 8.

Table 4-22: Category 5 and Category 8 Average Subscores, Deficiency Letters, and Percentage Work Quality for CPPR Subset

Project Delivery Method	Total Number of Projects	Category 5 Subscore Mean (max. of 10)	Category 5: Total Deficiency Letters Mean	Category 8 Subscore Mean (max. of 20)	Category 8: Percentage Work Quality Mean
Design Bid Build	689	9.8	0.1	19.4	96.4%
DB (Minor)	60	9.8	0.1	19.6	95.4%
DB (Major)	22	9.5	0.3	19.7	97.8%
Lump Sum	264	9.9	0.1	19.2	96.7%
Incentive/Disincentive+	3	10	0	19.3	97.7%
A+B	-	-	-	-	-
No Excuse Bonus	-	-	-	-	-
Total:	1038				

+ *No interpretations have been made for categories with fewer than 5 projects*

Figure 4-10 overlays the Category 5 and 8 subscores to see both the individual trends as well as determine any correlation. Average subscores for Category 5 show that Lump Sum is higher than Design Bid Build, while Design Build (Major) is below, and Design Build (Minor) is on par. Average subscores for Category 8 show Design Build (Minor) and Design Build (Major) as being above Design Bid Build, while Lump Sum is below. It is interesting to see how Design Build (Major), with the lowest subscore for Category 5 corresponds with the highest subscore for Category 8. There seems to be no rational reason explaining this detail, since the contractor's diligence in addressing the inspector's concerns (per Category 5) should not have an inverse relation to the contractor's ability to follow the guidelines set forth in the project specifications (per Category 8).

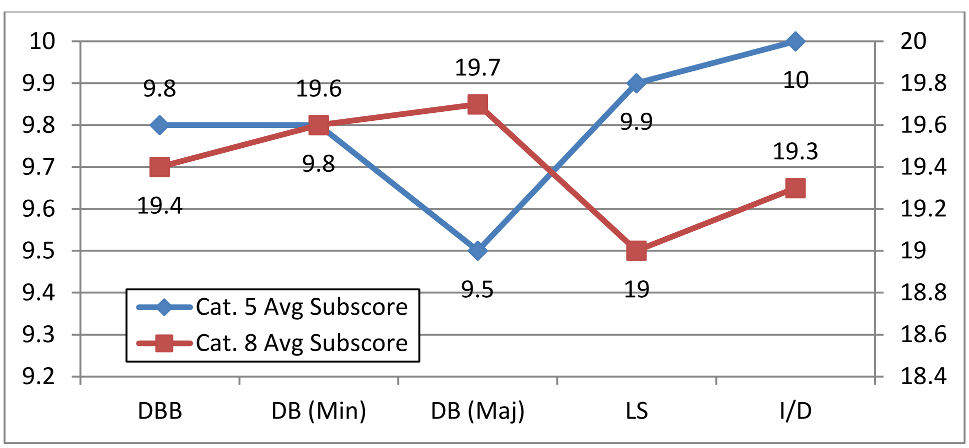


Figure 4-10: Average Category 5 and Category 8 Subscores for Subset

Figure 4-11 overlay Category 5 subscores with the average number of deficiency letters. As expected, and as illustrated for Design Build (Major), a lower subscore seems to correspond to a higher number of deficiency letters – and vice versa as is the case for Design Bid Build, Design Build (Minor), and Lump Sum.

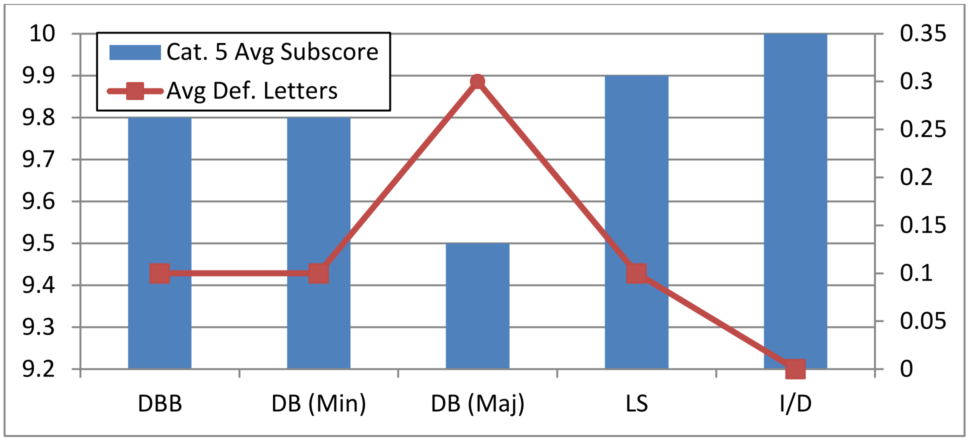


Figure 4-11: Category 5 Average Subscores and Average Deficiency Letters

Likewise, Figure 4-12 overlays Category 8 average subscores with average percentage work quality. Here, however, the trend is not consistent with what is expected. It is expected that the highest subscore would correspond with the highest percentage – as is the case for Design Build (Major). Nonetheless, the trend does not follow throughout the graph because Design Build (Minor) with the next highest subscore, does not have the second highest percentage work quality. This is rather peculiar since the total points awarded for Category 8 is related to the calculated percentage work complete.

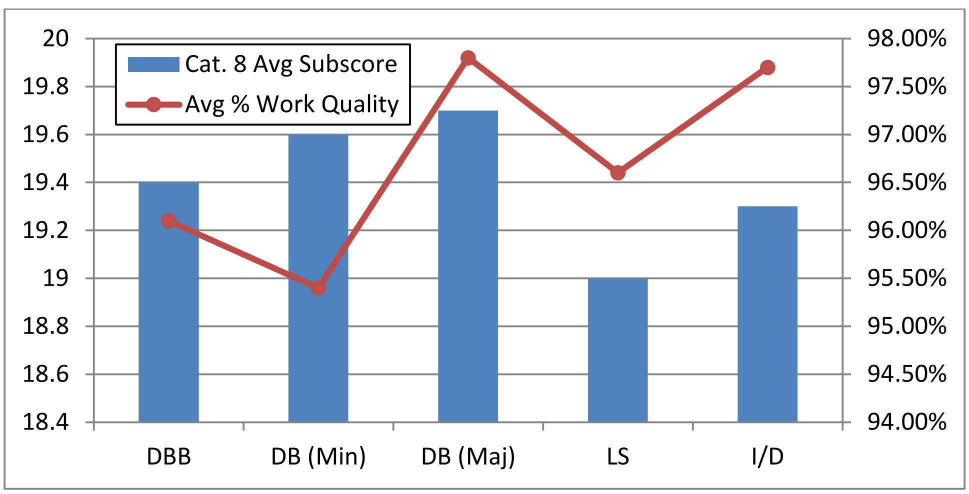


Figure 4-12: Category 8 Average Subscores and Average Percentage Work Quality

Chapter 5: Summary

Commentary on Findings

With each progressive step in the research project, and with the gathering of added information, the survey, interview, and data analysis tools provided an emerging picture into the FDOT's use of alternative contracting methods in highway construction project administration. The surveys provided a condensed view into the expressed opinions of the research participants on each contracting method. The interviews shed light on greater concerns and offered immediate solutions and recommendations. Finally, the cost, time, and quality data analysis provided concrete information with which to perform empirical analysis and method evaluations.

Survey Results

As an initial review of the alternative contracting methods, the survey provided a preliminary view into the attitudes of the industry on the alternative methods in question. From the survey data, Table 5-1 provides an assessment of how each method performed with regard to cost-, schedule-, and quality-improvement. Assessments were based primarily on contracting method conclusions and responded commentary.

Table 5-1: Preliminary Performance Review Based on Survey Results

	Improved Cost	Improved Schedule	Improved Quality
A+B		✓	
Designers	✓	✓	
Contractors		✓	
Inspectors		✓	
Lump Sum		✓	
Designers		✓	✓
Contractors	✓	✓	
Inspectors	✓	✓	
NEB		✓	
Designers		✓	
Contractors		✓	
Inspectors		✓	
I/C		✓	
Designers		✓	
Contractors		✓	
Inspectors		✓	
DB	✓	✓	
Designers	✓	✓	
Contractors	✓	✓	
Inspectors	✓	✓	

Interview Results

Interview responses provided an expanded view on the use of each alternative contracting method as explicitly employed by the individual district offices. Participant responses also addressed key issues of interest to the FDOT including project specifications, quality concerns, appropriate method selection and use, community relations, procurement selection, and compensation.

Design Build Issues Addressed

- Regarding special provision ambiguities, most respondents felt nothing specifically stood out
- Regarding impacts/effects on the QC/QA process, the majority of respondents felt there was no difference – as the quality requirements are stipulated in the contract, they are compulsory and entirely independent of contracting method
- Regarding appropriateness of project types, and bonuses/incentives, the majority of the respondents felt the projects were appropriately assigned to their corresponding contracting method; however, some respondents felt the bonuses were not sufficient for the efforts required to meet project deadlines
- Regarding distribution of projects by contracting method, most respondents felt the FDOT is picking the right projects for their program although several individuals mentioned the need to increase use of such methods as Lump Sum
- Regarding Adjusted Score versus Low Bid for Design Build, most respondents felt the FDOT is selecting the right method for the right project; however, some individuals expressed their concern with the subjective nature of the Adjust Score method
- Regarding the clarity and restrictiveness of RFPs, the majority of respondents felt the RFPs were clear enough and not overly restrictive
- Regarding the selection and evaluation of Design Build projects, most respondents said it was fair, but a few also voiced concerns with the incongruousness in the scoring system
- Regarding stipends for non-selected bidders, the vast majority of respondents felt compensation is not sufficient for the amount of designer effort required to supply bid proposals – and a few suggest either increasing the monetary amount of the stipend, or increasing the number of bidders awarded stipends

A+B Bidding Issues Addressed

- Regarding special provisions, respondents were split with whether they are too ambiguous
- Regarding impacts/effects on the QC/QA process, most of the respondents felt there was no difference – as the quality requirements are stipulated in the contract, they are compulsory and entirely independent of contracting method
- Regarding appropriateness of project types, and bonuses/incentives, most felt the projects were appropriately assigned to their corresponding contracting method, and most felt the bonuses were appropriate

- Regarding the maximum time set by the FDOT, most respondents said it was reasonable although a few noted that depending on the project some times are unreasonable
- Regarding distribution of projects by contracting method, most felt the FDOT is picking the right projects for their program

No Excuse Bonus Issues Addressed

- Regarding special provisions, respondents felt they either could not properly respond or felt there were ambiguities but could not properly identify specific examples
- Regarding impacts/effects on the QC/QA process, most respondents felt there was no difference since warranties are intrinsic to the contract and will account for product quality
- Regarding appropriateness of project types, and bonuses/incentives, most felt the projects were appropriately assigned to their corresponding contracting method, but they were mostly split with regards to incentives being set at appropriate levels
- Regarding if bonuses/incentives are worth the contractor's efforts, respondents were split on the decision or unsure on the matter
- Regarding distribution of projects by contracting method, responses were inconclusive with conflicting comments that No Excuse Bonus is and is not used enough

Incentive/Disincentive Issues Addressed

- Regarding special provision ambiguity, responses were inconclusive with comments that incentive and disincentive dates should be adjusted
- Regarding impacts/effects on the QC/QA process, most respondents felt there was no difference with overall product quality
- Regarding appropriateness of project types, and bonuses/incentives, most felt the projects were appropriately assigned to their corresponding contracting method, and most felt the incentives were set at appropriate levels
- Regarding if bonuses/incentives are worth the contractor's efforts, respondents were split on the decision
- Regarding distribution of projects by contracting method, many respondents mentioned there should be increased use of Incentive/Disincentive

Lump Sum Issues Addressed

- Regarding special provision ambiguity, many respondents were unsure on the matter, and the only significant comment was the need to have a better definition of percentage of plan quantity items
- Regarding impacts/effects on the QC/QA process, the majority of respondents felt there was no difference with the process
- Regarding appropriateness of project types, and bonuses/incentives, most felt the projects were appropriately assigned to their corresponding contracting method, and most felt the incentives were usually set at appropriate levels

- Regarding the design process for Lump Sum projects, most Designers felt there was no significant difference
- Regarding the inspection process for Lump Sum projects, most Inspectors felt it did permit more time/effort to focus on other aspects of inspection
- Regarding distribution of projects by contracting method, most respondents said the FDOT is picking the right projects for their program

Cost, Time, and Quality Performance Results

Analysis for the cost, time, and quality data provided more conclusive indicators of performance. Data collected from the FDOT database revealed that the traditional Design Bid Build delivery system was used more often than other alternative delivery systems in practice. Among these alternative delivery systems, Lump Sum and Design Build (Major and Minor) were more widely employed than Incentive/Disincentive, A+B, and No Excuse Bonus, which have seen very limited use by FDOT. Furthermore, the majority of the projects completed between 2006 and 2015 were below $10 million, only a small fraction of the projects were larger in terms of current contract amount.

Cost and Time Results

According to Table 5-2 which did not break down the projects on the basis of cost categories, all of the alternative contracting methods – with the exception of Lump Sum and Design Build (Minor) – outperformed the traditional Design Bid Build in terms of average days saved per project. Design Build (Minor) performed equally well as Design Bid Build in terms of average days saved per project, nevertheless, its average cost saved per project was more than Design Bid Build. It is noteworthy that although average days saved per project for Lump Sum is less than the other delivery methods, its average cost saved per project is more than all other delivery methods. Design Build (Major), Incentive/Disincentive, A+B, and Mo Excuse Bonus methods had more cost overrun than traditional Design Bid Build. As a result, it seems more effective to use Incentive/Disincentive, A+B, and No Excuse Bonus when the primary goal of a project is to finish as early as possible. On the contrary, when there are limited financial resources, Lump-Sum and Design Build (Minor) appear to be better choices.

Table 5-2: Collective Time and Cost Savings Analysis of All Project Delivery Methods

Project Delivery Method	Total Number of Projects	Time		Cost	
		% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
DBB	1,495	-1.97%	5	0.03%	$ (855.11)
DB (Minor)	147	-1.64%	5	-0.54%	$ 11,936.09
DB (Major)	86	-1.39%	6	1.69%	$ (135,470.11)
Lump Sum	602	-2.46%	3	-0.98%	$ 14,484.85
I/D	73	-10.42%	35	2.46%	$ (151,947.62)
A+B	21	-9.12%	44	4.54%	$ (679,946.79)
No Excuse Bonus	12	-11.04%	50	1.37%	$ (120,764.05)

Figure 5-1 illustrates the correlation between the average days and average costs saved in order to examine the associated benefits of each delivery method. The methods that save the least average days (Design Bid Build, Design Build (Minor), and Design Build (Major)) tend to save the most money. Likewise, the methods that saved the most days (Incentive/Disincentive, A+B, and No Excuse Bonus) saved the least money, with A+B costing exponentially more than the other methods shown. From this table, one may determine the best method for the specific requirements of the project – be it expedited savings or budget savings.

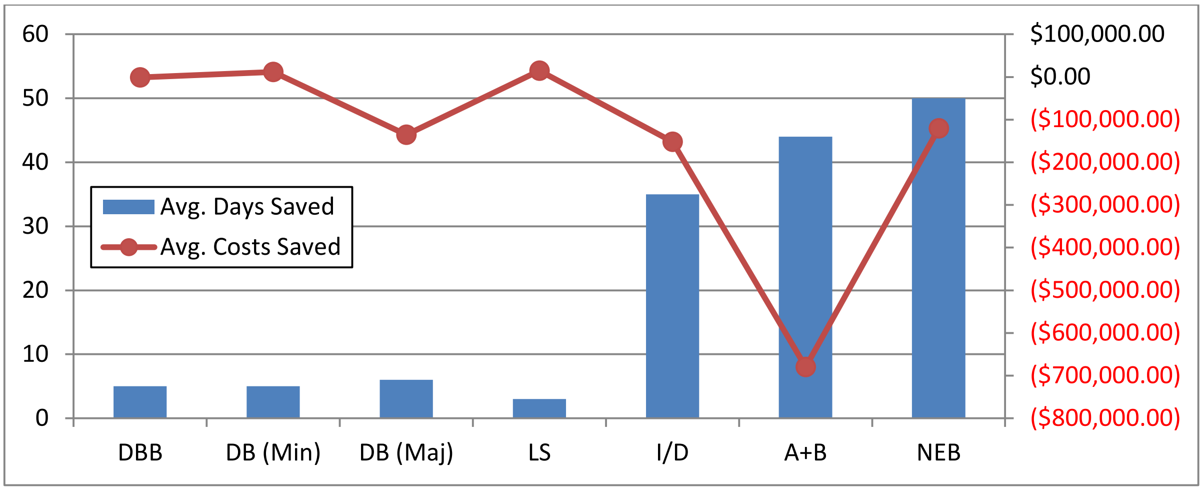


Figure 5-1: Average Days Saved and Average Costs Saved

Observing the considerable number of average days saved for Incentive/Disincentive, A+B, and No Excuse Bonus, it is worth considering the additional costs associated with these time savings. As presented in Table 5-3 and illustrated in Figure 5-1, the associated average costs per days saved provide valuable information if initially considering a delivery method which provides significant times savings. A FDOT District may contemplate using A+B for a project with severe schedule restrictions, but may second guess the extra added costs per day and may opt for another method such as Incentive/Disincentive that provides perhaps fewer day savings but also less added costs.

Table 5-3: Additional Costs Associated with Time Savings per Project Delivery Method

Project Delivery Method	Average Days Saved per Project	Average Cost Saved per Project	Associated Average Costs per Day Saved
DBB	5	$ (855.11)	$ (171.02)
DB (Major)	6	$ (135,470.11)	$ (22,578.35)
Incentive/Disincentive	35	$ (151,947.62)	$ (4,341.36)
A+B	44	$ (679,946.79)	$ (15,453.34)
No Excuse Bonus	50	$ (120,764.05)	$ (2,415.28)

As mentioned at the beginning of this report, to provide a better view on the time and cost performances of the delivery systems, projects were divided into several cost categories and further analysis was conducted. The results in time and cost performances per delivery methods do not provide an obvious conclusion on which is superior.

However, after investigating the data for each cost category, Table 5-4 attempts to show if, given a specific contracting method, there is a greater likelihood of a project of that size will come up under cost (or at cost) or over cost. Likewise, in Table 5-5 for a given contracting method, it is shown whether there is a greater likelihood of a project finishing early (or on time) or finishing late. These are all based on where the majority of the projects for each contracting method and price range fell in the data. For instances where there were not enough projects (under five) or no projects at all with which to perform data analysis, no likelihood is noted.

Table 5-4: Likelihood of Project Being Under or Over Cost

Delivery Method	Under $1M	$1M - $5M	$5M - $10M	$10M - $20M	Above $20M
DBB	↓$	↓$	↑$	↑$	↑$
DB (Min.)	↓$	↓$	↓$	-	-
DB (Maj.)	↓$	↓$	↓$	↑$	↑$
LS	↓$	↓$	↓$	↓$	-
I/D	↓$	↓$	↑$	↑$	-
A+B	-	↓$	-	↑$	↓$
NEB	-	↓$	-	-	-

Where cost savings are likely incurred, the symbol (↓$) is shown; and where cost increases are likely incurred, the symbol (↑$) is shown.

Table 5-5: Likelihood of Projects Being Under or Over Schedule

Delivery Method	Under $1M	$1M - $5M	$5M - $10M	$10M - $20M	Above $20M
DBB	↓🕑	↓🕑	↓🕑	🕑	↓🕑
DB (Min.)	↓🕑	🕑	🕑 / ↓🕑	-	-
DB (Maj.)	↓🕑	🕑	🕑	↓🕑	🕑 / ↓🕑
LS	↓🕑	↓🕑	↓🕑	🕑	-
I/D	↓🕑	↓🕑	↓🕑	↓🕑	-
A+B	-	🕑	-	↓🕑	↓🕑
NEB	-	↓🕑	-	-	-

Where time savings are likely incurred, the symbol (↓🕑) is shown; where project schedules are likely to be as estimated the symbol (🕑) is shown; and where the project schedule is just as likely to be as estimated, or to experience time savings, the symbol (🕑 / ↓🕑) is used.

Quality Performance Results

Analysis of recorded CPPR scores could not provide definitive information regarding project quality and its relation to any particular alternative contracting method. Comparing newer records (from the CPPR Subset) to larger and older scores (from the Quality Dataset), the more recent projects appear to have increased in ratings as observed in Figure 5-2. Corresponding with more recent projects, the subset illustrates how increased usage and familiarity with newer delivery systems increases proficiency on the part of the contractor.

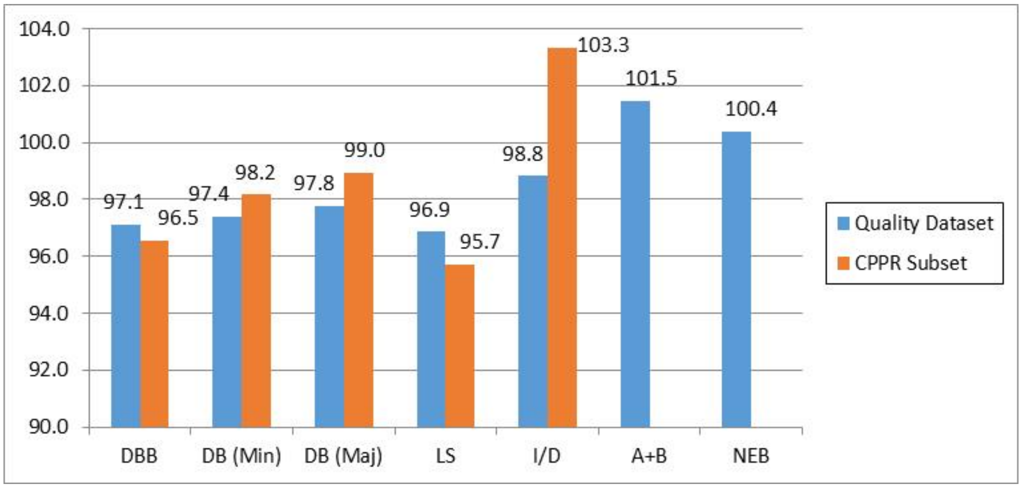


Figure 5-2: Comparison of CPPR Scores for Quality Dataset and CPPR Subset

As the newer subset also represents a more detailed collection of CPPR subscores (including breakdown scores for all nine categories as well as specific data pertaining to such information as number of deficiency letters, or allowable days versus quality days), this increased interest on the FDOT's part in the value, significance, and effect of these ratings. As such, contractors are making more of an effort to earn the higher scores, thus ensuring likelihood of continued selection for future construction projects.

Attempts were made to focus on the two specific categories that relate more directly to overall project quality: coordination and cooperation with inspection personnel (Category 5); and conformance with project documents (Category 8). Comparing these subscores in Figure 5-3, it was shown that projects scoring the highest for Category 8 performed more poorly on Category 5. This seemed conflicting as a contractor's proclivity to follow the requirements established in the contract documents (as evaluated in Category 8) would correspond with the contractor's coordination with inspection personnel – whose job it is to verify the same requirements established in the specifications.

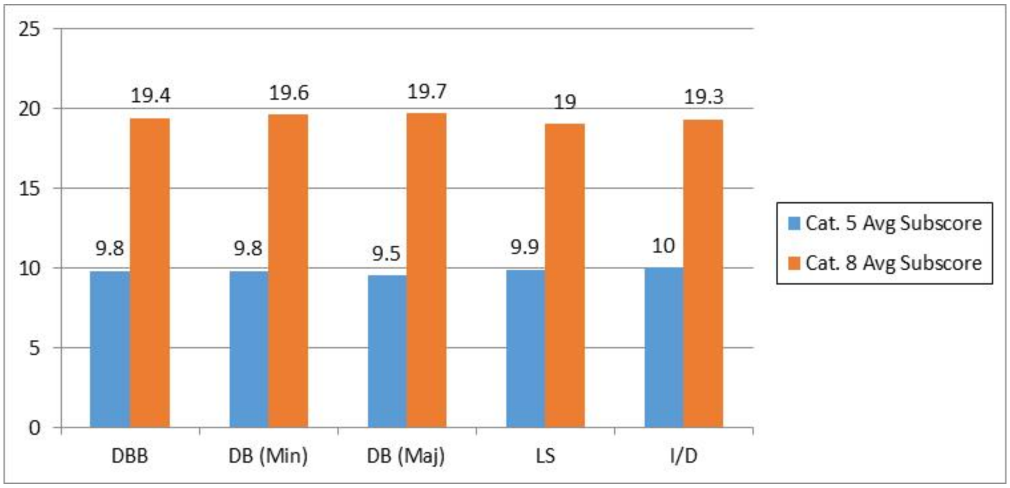


Figure 5-3: Comparison of Category 5 and Category 8 Subscores for Quality Dataset and CPPR Subset

This conclusion that project delivery selection does not necessarily have an effect on overall project quality is further supported by the research teams' interview investigations. Per the FDOT's inquiries on a contracting method's influence on the quality control and quality assurance process, the majority of respondents expressed that project quality was independent of contracting methods, as quality standards are established in the project specifications. The research team concurs with this statement supporting that project requirements – and not contracting methods – dictate quality standard adherence.

Comparison to Previous Program Evaluation

To provide some information as to how the alternative delivery systems have been used after 2006 and their corresponding performances, the results obtained from this research were compared with the previous research initiated by FDOT about 10 years ago.

With regard to application of the delivery systems, there is a significant increase in Design Build and Lump Sum as opposed to a drastic decrease in the use of No Excuse Bonus, Incentive/Disincentive, and A+B. Design Bid Build is still the most popular tool among FDOT personnel in practice (see Figure 5-4).

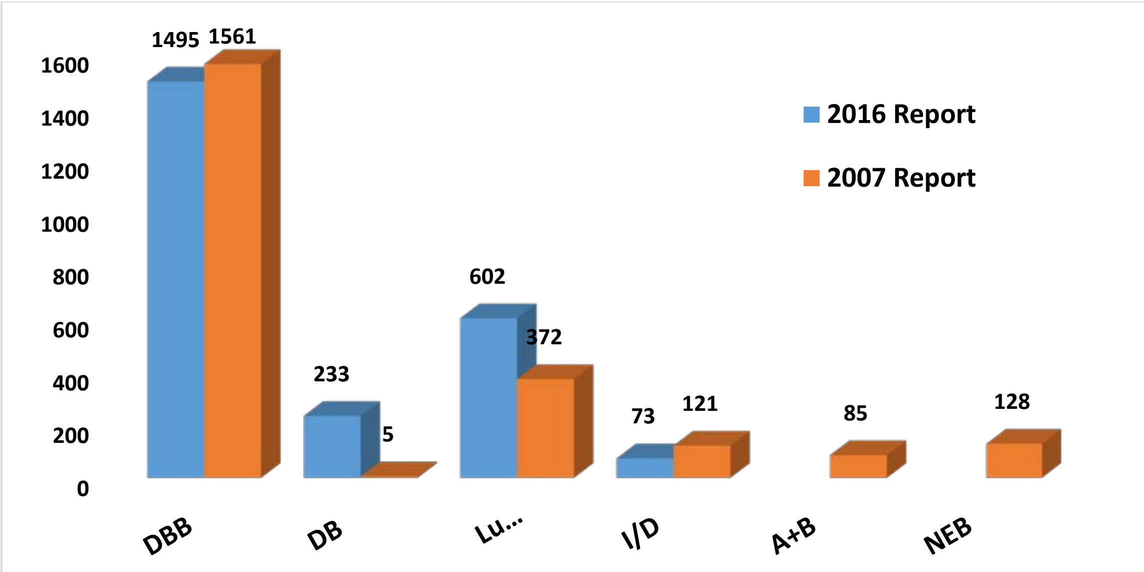


Figure 5-4: Comparison of the Number of Projects Regarding the Delivery Methods between 2007 and 2016 Reports

Figures 5-5 and 5-6 reflect that all delivery systems performed better in the 2007 report than in the 2016 report in terms of time savings.

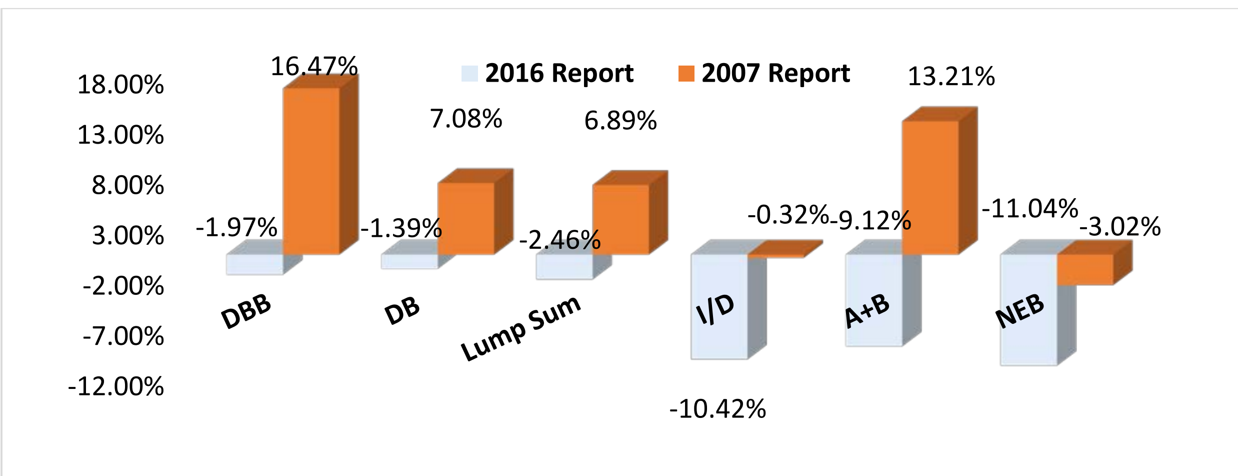


Figure 5-5: Comparison of Time Saving in Percentage Regarding the Delivery Methods between 2007 and 2016 Reports

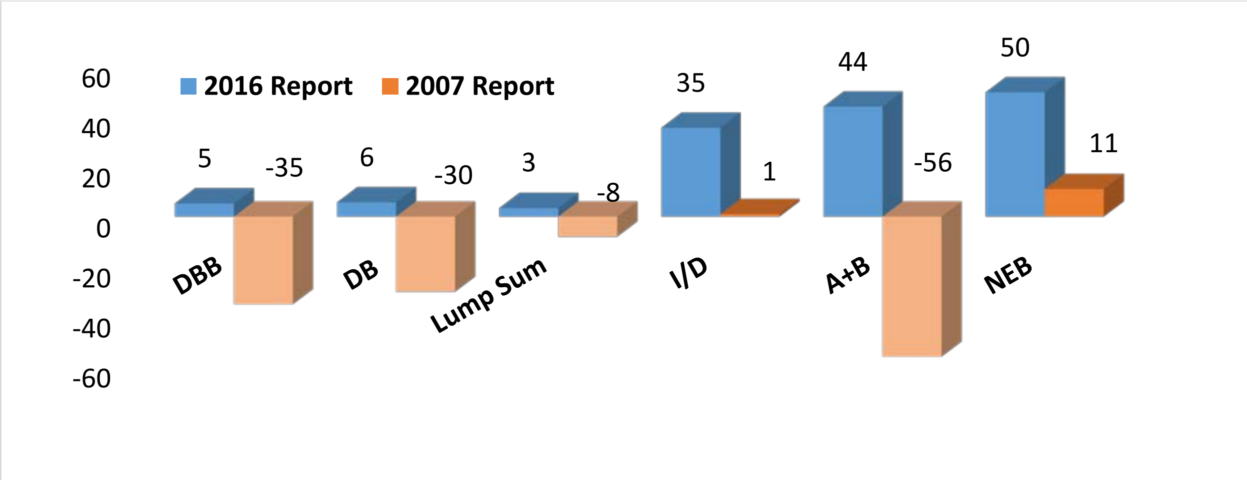


Figure 5-6: Comparison of Time Saving in Days Regarding the Delivery Methods between 2007 and 2016 Reports

In regard to cost saving, Figure 5-7 and 5-8 showed that all delivery systems performed better in the 2007 report than the 2016 report in terms of cost savings.

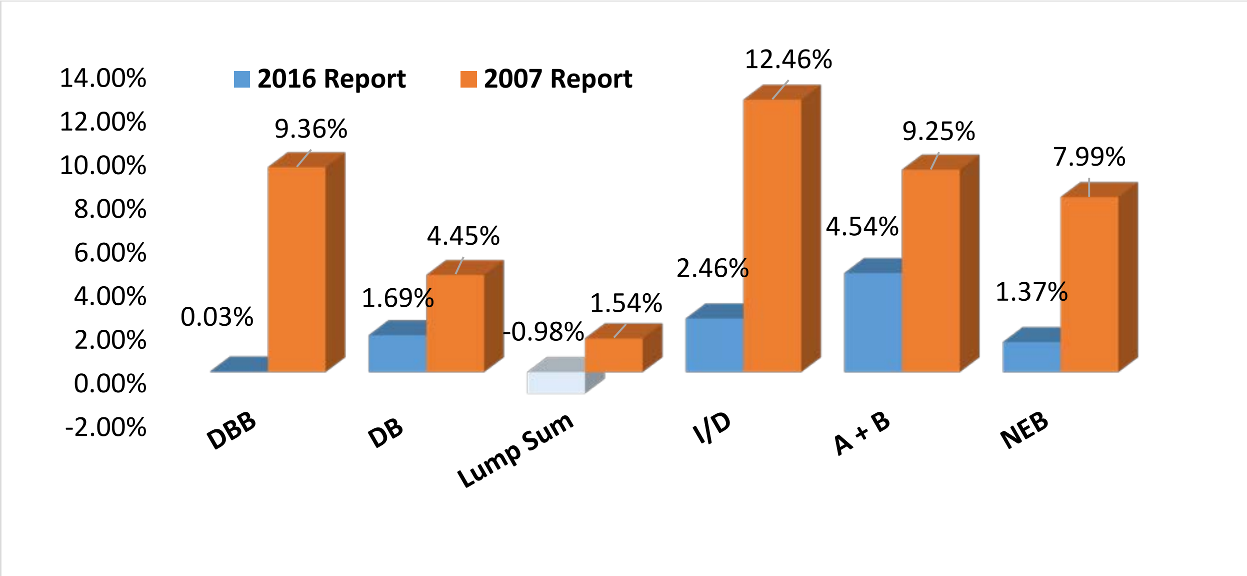


Figure 5-7: Comparison of Cost Saving in Percentage Regarding the Delivery Methods between 2007 and 2016 Reports

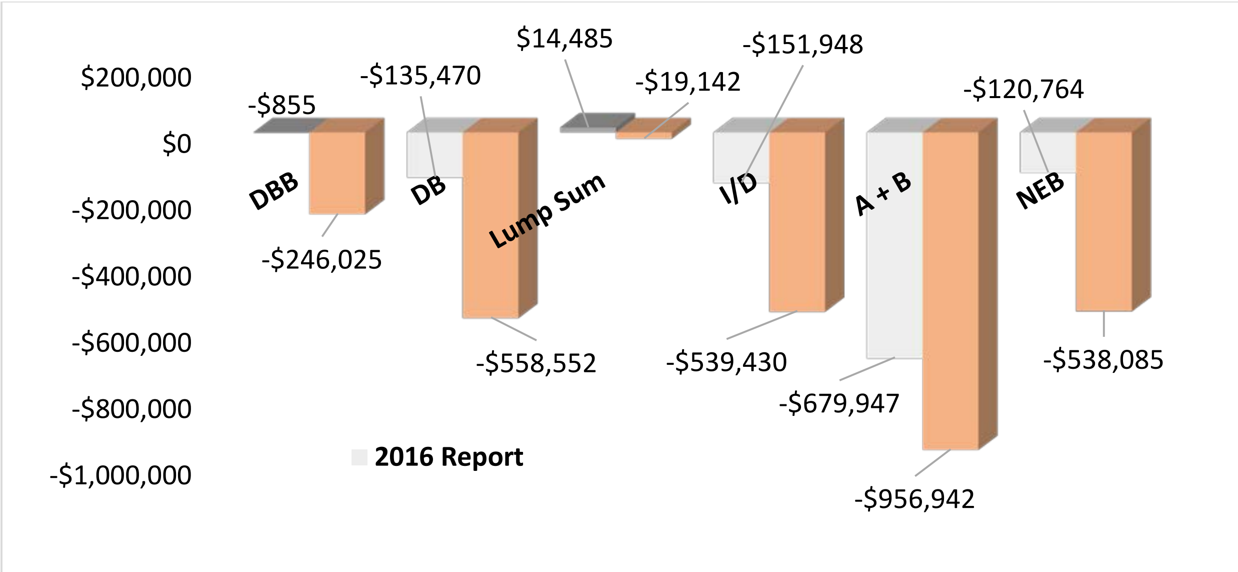


Figure 5-8: Comparison of Cost Saving Regarding the Delivery Methods between 2007 and 2016 Reports

The comparison of the 2007 and 2016 data shows that with increased usage of the alternative project delivery systems, contractors over time have become more proficient in the nuances of the specific methods. In addition, the time and cost savings for Design Bid Build delivery system have also increased from the 2007 report to the 2016 report, therefore, it can be assumed that there has been a significant increase in value of the FDOT construction project in the last ten years.

Observed Limitations

Throughout the course of the research project, certain issues stood out as being obvious limitations. Table 5-6 attempts to identify the limitations encountered.

Table 5-6: Observed Limitations

Project Activities	
Survey	• Insufficient number of respondents to conduct proper statistical analysis: - low representation of contracting methods among district offices - low representation of participants among the categories • Survey response solicitation: - difficult to prove survey link legitimacy and/or prevent email spam filtering of correspondence
Interview	• Insufficient number of respondents to conduct proper statistical analysis: - low representation of contracting method experience among participants • Open-ended nature of questions provided an over-abundance of response information that proved time-consuming to interpret
Cost, Time, and Quality Data	• Insufficient number of projects to conduct proper statistical analysis: - FDOT's use of contracting method combinations limited availability of projects (to analyze effects of only the methods in question) • CPPR scores (and subscores) not available for all projects • Comparisons based solely on contracting methods and cost categories cannot fully account for project associations

Final Recommendations

The research team suggests the following practical solutions to address the concerns above. Table 5-7 identifies these recommendations:

Table 5-7: Final Recommendations

Project Activities	
Survey	• Consider increasing pool of participants by including city, municipal, or private data • Distribute surveys using a known email address (such as that of an FDOT official), or make participation (somewhat) mandatory for vendors
Interview	• Consider increasing pool of participants by including city, municipal, or private data • Consider use of voice-recognition software to analyze interview responses
Cost, Time, and Quality Data	• Consider studying effects of the several contracting method combinations already in use by the FDOT • Consider other quality measures (LIMS was a possibility, but was contingent upon similar project type analysis) • Consider investigating project type influence on contracting method performance

As mentioned at the beginning of this report, to provide a better view on the time and cost performances of the delivery systems, projects were divided into several cost categories and further analysis was conducted. The results in time and cost performances per delivery methods, however, did not reveal an obvious solution as to which method is superior.

Extensive use by the FDOT of combined contracting methods – as evident by the heavy use of A+B and I/D – suggests the department has unwittingly taken steps to pair the methods to provide mutual benefit. The shortcomings of one method can be counteracted by the attributes of another for the benefit of the department, industry, and public.

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Appendix A: Survey Instrument

Appendix A includes the survey instrument, in its entirety, as presented to the survey participants. This includes questions that were omitted from the report, either due to irrelevance to the response analysis, or from selective omission due to participant anonymity. Questions that were deemed irrelevant are those whose purpose was not to obtain information from the participants but to present information pertinent to the representation and understanding of the survey. The Introduction section (Q1) and Terminology and Abbreviations section (Q5) fall under this category and are presented for contextual reference.

Introduction

Q1. The purpose of this study is to investigate the use of alternative contracting methods and evaluate their overall performance with regard to project cost, schedule, and quality as compared to traditionally delivered projects (i.e., low bid Design Bid Build).

The information you provide in this survey will be vital in evaluating the FDOT's Alternative Contracting program. Your feedback will help assess current practice and will assist in improving the program.

Please click the ">>" button below to continue. Thank you for your participation.

Personal Information

Q2. Personal Information

Name: ______________________________

Agency: ______________________________

Position/Title: ______________________________

Phone Number: ______________________________

Email Address: ______________________________

Q3. Employer Description *(select all that apply)*

- ☐ Owner
- ☐ Contractor
- ☐ Consultant

Q4. Project Relationship *(select all that apply)*

- ☐ Designer
- ☐ Administrator
- ☐ Inspection

Terminology and Abbreviations

Q5. This survey includes specific terms and abbreviations. Following are brief explanations of those terms.

Terminology

Alternative Contracting Methods: For this project, any method other than Design Bid Build
Traditional Projects: Synonymous with competitively-bid Design Bid Build projects

Abbreviations

CEI: Construction Engineering and Inspection
ROW: Right-of-way

Definitions

A+B Bidding: Contractor's total bid is composed of a standard cost portion ("A") as well as a time portion ("B"). The time component is calculated by multiplying the estimated contract days by a pre-established price per day. *(Also known as Cost-Plus-Time)*
Lump Sum Contracting: Contractor submits one price for estimated project completion rather than bidding on pay items individually.
No Excuse Bonus: Contractor is awarded a bonus for early completion, regardless of project delays or unforeseen site conditions.
Incentive/Disincentive: Contractor is rewarded for early completion and penalized for project delays.
Design Build: Project Delivery method where a contract is awarded to one single entity (comprised of a designer and contractor). The team works together throughout the entirety of the project, permitting overlap of the design and construction phases of the project.

Experience

Q6. Personal Experience

#	Question	no experience	1-5 years	6-10 years	11-15 years	16-20 years	20+ years	Total Responses
1	With current agency							
2	In current position							
3	With alternative contracting methods (in general)							
4	With A+B Bidding							
5	With Lump Sum Contracting							
6	With No Excuse Bonus							
7	With Incentive/Disincentive							
8	With Design Build							

Q7. Project Experience *(number of projects you have been involve in)*

#	Question	0 projects	1-5 projects	6-10 projects	11-20 projects	21-50 projects	51-100 projects	Total Responses
1	A+B Bidding							
2	Lump Sum Contracting							
3	No Excuse Bonus							
4	Incentive/Disincentive							
5	Design Build							

A+B Bidding

Q8. The following statements have been cited regarding A+B Bidding compared to Design Bid Build. Please indicate if you agree or disagree with the statement, or are unable to judge.

A+B Bidding

#	Question	Agree	Disagree	Unable to Judge	Total Responses
Cost					
1	Results in substantial savings				
Time					
2	Reduces contract time				
3	More influenced by inclement weather				
4	Most contractors completed the project on time or ahead of schedule				
5	Motivates contractors to work faster				
6	Motivates contractors to have more accurate scheduling				
Quality					
7	Improves project quality				
8	Motivates contractors to have more efficient project management				
9	Motivates contractors to have better resource management				
Others					
10	Best suited for bridge projects				
11	Best suited for reconstruction or rehabilitation projects that will disrupt traffic				
12	Best suited for major bridges that are out of service				
13	Best suited for projects with lengthy detours or high traffic				
14	Has wide agency support				
15	Frequently used with Incentive/Disincentive				

Q9. Comments on any of the above statements *(Please reference the statement number in your comments)*

____

Q10. In your opinion, what is the most significant advantage of A+B Bidding?

____

Q11. In your opinion, what is the most significant disadvantage of A+B Bidding?

____

<u>Lump Sum Contracting</u>

Q12. The following statements have been cited regarding <u>Lump Sum Contracting</u> compared to <u>Design Bid Build</u>. Please indicate if you agree or disagree with the statement, or are unable to judge.

Lump Sum Contracting

#	Question	Agree	Disagree	Unable to Judge	Total Responses
Cost					
1	Contractors may add a greater contingency to their bids				
Time					
2	Reduces time spent measuring quantities				
Quality					
3	Offers owner the best protection				
4	There is a higher demand on design quality				
5	Contractor administration is much easier				
Others					
6	Best suited for simple (activity-wise) jobs				
7	Best implemented when the scope is defined and understood by all parties				
8	Best suited for projects that have well-defined risks				
9	Best suited for projects that have a low risk of unforeseen conditions				
10	Best suited for projects that have a low possibility of change				
11	Best suited for projects when there exists uncertainty in quantity estimates				

Q13. Comments on any of the above statements *(Please reference the statement number in your comments)*

Q14. In your opinion, what is the most significant <u>advantage</u> of <u>Lump Sum Contracting</u>?

Q15. In your opinion, what is the most significant <u>disadvantage</u> of <u>Lump Sum Contracting</u>?

No Excuse Bonus

Q16. The following statements have been cited regarding No Excuse Bonus compared to Design Bid Build. Please indicate if you agree or disagree with the statement, or are unable to judge.

No Excuse Bonus

#	Question	Agree	Disagree	Unable to Judge	Total Responses
Cost					
1	Often results in increased costs in order to cover unexpected delay risks				
2	Bonus must outweigh use of additional resources that are typically required to finish early				
3	Graduated bonuses are preferred to all-or-nothing bonuses				
4	Contractors typically share bonuses with subcontractors to motivate their cooperation				
Time					
5	Results in faster project completion				
6	Requires expending additional resources to finish early				
7	Utility schedules are critical to these types of projects				
Quality					
8	Provides continual motivation throughout the project duration				
Others					
9	Promotes efficient construction				
10	Reduces disruption to the general public				
11	Best suited for projects with large budgets				
12	Best suited for projects with long durations				
13	Best suited for projects that can be constructed outside hurricane season				
14	Best suited for projects with high traffic				
15	Best suited for high visibility projects				
16	Best suited for emergency situations				

Q17. Comments on any of the above statements *(Please reference the statement number in your comments)*

____

____

Q18. In your opinion, what is the most significant advantage of No Excuse Bonus?

____

____

Q19. In your opinion, what is the most significant disadvantage of No Excuse Bonus?

____

____

<u>Incentive/Disincentive</u>

Q20. The following statements have been cited regarding <u>Incentive/Disincentive</u> compared to <u>Design Bid Build</u>. Please indicate if you agree or disagree with the statement, or are unable to judge.

Incentive/Disincentive

#	Question	Agree	Disagree	Unable to Judge	Total Responses
Cost					
1	Often results in increased construction costs				
2	Reduces CEI costs due to shorter schedule				
Time					
3	Unforeseen conflicts require timelier responses than with traditional projects				
4	Often results in utility conflicts				
5	Projects are completed on time or early				
Quality					
6	Often results in reduced quality				
7	Increases the number of, and value of, change orders				
8	Increases need for field inspections				
Others					
9	Best suited for high volume (traffic-wise) projects				
10	Best suited for large projects				
11	Best suited for interstate projects				
12	Best suited for projects that will cause severe economic impact on local businesses				
13	Best suited for projects that will impair emergency service success for a prolonged amount of time				
14	Best suited for projects where the safety of road users or construction workers is at risk				
15	Best suited for projects that require lengthy detours on poorly maintained roads				
16	Best suited for projects that severely impact traffic on main arteries				
17	Frequently used with A+B bidding				

Q21. Comments on any of the above statements *(Please reference the statement number in your comments)*

____

____

Q22. In your opinion, what is the most significant <u>advantage</u> of <u>Incentive/Disincentive</u>?

____

____

Q23. In your opinion, what is the most significant <u>disadvantage</u> of <u>Incentive/Disincentive</u>?

____

____

A+B and Incentive/Disincentive

Q24. In the past 10 years, for highway construction projects greater than $1 million, the FDOT has completed more jobs using A_B and Incentive/Disincentive together (A+B & I/D) than by using A+B alone.

The following statements are in regard to the use of <u>A+B and Incentive/Disincentive, together</u>. Please indicate if you agree or disagree with the statement, or are unable to judge.

A+B and Incentive/Disincentive

#	Question	Agree	Disagree	Unable to Judge	Total Responses
1	It is more effective to pair the two methods together				
2	A+B & I/D should always be paired together				
3	A+B & I/D provides greater cost savings than A+B alone				
4	A+B & I/D provides greater time savings than A+B alone				
5	A+B & I/D provides greater quality than A+B alone				

Q25. Comments on any of the above statements *(Please reference the statement number in your comments)*

____

____

____

Q26. In your opinion, what is the most significant <u>advantage</u> of using <u>A+B and Incentive/Disincentive, together</u>?

____

____

____

Q27. In your opinion, what is the most significant <u>disadvantage</u> of using <u>A+B and Incentive/Disincentive, together</u>?

____

____

____

Design Build

Q28. The following statements have been cited regarding Design Build compared to Design Bid Build. Please indicate if you agree or disagree with the statement, or are unable to judge.

Design Build

#	Question	Agree	Disagree	Unable to Judge	Total Responses
Cost					
1	Unit costs are lower				
2	Cost growth is lower				
Time					
3	Construction speed is faster				
4	Delivery speed is faster				
5	Sensitive to schedule delays				
6	Time savings is the greatest advantage to this contracting method				
Quality					
7	Promotes design flexibility				
8	Provides contractor flexibility				
9	Promotes optimization of project design				
10	Promotes optimization of construction methods				
11	Reduces owner's/agency's control of design				
12	Increases risk for the design professional				
13	Contract administration is similar				
Others					
14	Not ideal for projects with high quantities of ROW and util.				
15	Better relationship between agency and contractor than between agency and design professional				
16	There is a lower level of contention between the owner and the contractor				
17	There is a lower level of contention between the owner and the designer				
18	Greater familiarity with project contractors than with those obtained through a bidding process				

Q29. Comments on any of the above statements *(Please reference the statement number in your comments)*

____

____

Q30. In your opinion, what is the most significant advantage of Design Build?

____

____

Q31. In your opinion, what is the most significant disadvantage of Design Build?

____

____

Appendix B: Survey Participant Responses and Trends

Appendix B includes the survey participant responses, and preliminary analysis of response trends. The Introduction section (Q1) and Terminology and Abbreviations section (Q5) were omitted as they provided information to aid in the understanding of the survey. The Personal Information section (Q2-Q4) was also omitted to maintain participant anonymity.

(In the sections that follow, participant responses to cited literature are presented and percentages of confirmation were established as follows:

- *highly confirmed: 80% agreement, or more*
- *confirmed: 60%-79% agreement*
- *mixed response: 40%-59% agreement*
- *refuted: 20%-39% agreement*
- *highly refuted: less than 20% agreement*

These values were calculated solely for the purpose of objectively interpreting the responses.)

Experience

Q6. Personal Experience

Table B-1: Survey Participant Personal Experience Breakdown

#	Question	no experience	1-5 years	6-10 years	11-15 years	16-20 years	20+ years	Total Responses
1	With current agency	0	13	23	18	16	29	99
2	In current position	0	31	27	13	15	13	99
3	With alternative contracting methods (in general)	5	19	17	30	17	9	97
4	With A+B Bidding	21	34	14	12	11	6	98
5	With Lump Sum Contracting	3	28	17	21	16	13	98
6	With No Excuse Bonus	25	25	16	15	10	6	97
7	With Incentive/Disincentive	16	23	21	16	13	9	98
8	With Design Build	14	29	24	17	9	6	99

**Totals differ from numbers in Table 8 because not all respondents answered this question*

Q7. Project Experience (number of projects you have been involve in)

Table B-2: Survey Participant Project Experience Breakdown

#	Question	0 projects	1-5 projects	6-10 projects	11-20 projects	21-50 projects	51-100 projects	Total Responses
1	A+B Bidding	24	53	9	6	4	1	97
2	Lump Sum Contracting	3	45	10	13	15	11	97
3	No Excuse Bonus	30	50	10	3	1	1	95
4	Incentive/Disincentive	21	47	12	11	3	2	96
5	Design Build	16	41	16	12	10	2	97

**Totals differ from numbers in Table 8 because not all respondents answered this question*

A+B Bidding

Q8. The following statements have been cited regarding A+B Bidding compared to Design Bid Build. Please indicate if you agree or disagree with the statement, or are unable to judge.

Table B-3: A+B Literature Agreement

#	Question	Agree	Disagree	Unable to Judge	Total Responses
Cost					
1	Results in substantial savings	23	28	40	91
		45% of 51	55% of 51		
Time					
2	Reduces contract time	48	20	24	92
		71% of 68	29% of 68		
3	More influenced by inclement weather	36	24	31	91
		60% of 60	40% of 60		
4	Most contractors completed the project on time or ahead of schedule	43	16	32	91
		73% of 59	27% of 59		
5	Motivates contractors to work faster	51	20	20	91
		72% of 71	28% of 71		
6	Motivates contractors to have more accurate scheduling	48	16	27	91
		75% of 64	25% of 64		
Quality					
7	Improves project quality	9	44	38	91
		17% of 53	83% of 53		
8	Motivates contractors to have more efficient project management	46	21	23	90
		69% of 67	31% of 67		
9	Motivates contractors to have better resource management	48	18	25	91
		73% of 66	27% of 66		
Others					
10	Best suited for bridge projects	14	36	40	90
		28% of 50	72% of 50		
11	Best suited for reconstruction or rehabilitation projects that will disrupt traffic	48	16	27	91
		75% of 64	25% of 65		
12	Best suited for major bridges that are out of service	31	23	37	91
		57%	43%		

		of 54	of 54		
13	Best suited for projects with lengthy detours or high traffic	41	19	30	90
		68% of 60	32% of 60		
14	Has wide agency support	24	16	51	91
		60% of 40	40% of 40		
15	Frequently used with Incentive/Disincentive	45	6	40	91
		88% of 51	12% of 51		

Looking solely at the total number of respondents that either agree or disagree with the above statements, and using previously calculated percentages of confirmation (equal or greater than 80% agreement as highly confirmed; 60%-79% agreement as confirmed; 40%-59% agreement as mixed response; 20%-39% agreement as refuted; and less than 20% agreement as highly refuted), the following can be derived from the use of A+B Bidding:

- Statement 15 is highly confirmed with the literature
- Statements 2, 3, 4, 5, 6, 8, 9, 11, 13, and 14 are confirmed with the literature
- Statements 1 and 12 received mixed responses
- Statement 10 refutes the literature
- None of the statements highly refute the literature

Table B-4: A+B Literature Agreement Breakdown by Participant Category

		Agree			Disagree			
#	**Participant**	**Num.**	**Percent.**	**Agree Avg.**	**Num.**	**Percent.**	**Disagree Avg.**	**Total**
1	Designers	7	64%		4	36%		11
	FDOT	*5*	*83%*		*1*	*17%*		*6*
	non-FDOT	*2*	*40%*		*3*	*60%*		*5*
	Contractors	3	25%	45%	9	75%	55%	12
	Inspectors	13	13		15	15		28
	FDOT	*7*	*64%*		*4*	*36%*		*11*
	non-FDOT	*6*	*35%*		*11*	*65%*		*17*
2	Designers	14	88%		2	13%		16
	FDOT	*5*	*71%*		*2*	*29%*		*7*
	non-FDOT	*9*	*100%*		*0*	*0%*		*9*
	Contractors	13	76%	71%	4	24%	29%	17
	Inspectors	21	60%		14	40%		35
	FDOT	*9*	*64%*		*5*	*36%*		*14*
	non-FDOT	*12*	*57%*		*9*	*43%*		*21*
3	Designers	11	79%		3	21%		14
	FDOT	*4*	*67%*		*2*	*33%*		*6*
	non-FDOT	*7*	*88%*		*1*	*13%*		*8*
	Contractors	10	67%	60%	5	33%	40%	15
	Inspectors	15	48%		16	52%		31
	FDOT	*6*	*50%*		*6*	*50%*		*12*
	non-FDOT	*9*	*47%*		*10*	*53%*		*19*
4	Designers	11	85%		2	15%		13
	FDOT	*4*	*80%*	73%	*1*	*20%*	27%	*5*
	non-FDOT	*7*	*88%*		*1*	*13%*		*8*
	Contractors	10	67%		5	33%		15

	Inspectors	22	71%		9	29%		31
	FDOT	*9*	*75%*		*3*	*25%*		*12*
	non-FDOT	*13*	*68%*		*6*	*32%*		*19*
5	Designers	15	83%		3	17%		18
	FDOT	*5*	*63%*		*3*	*38%*		*8*
	non-FDOT	*10*	*100%*		*0*	*0%*		*10*
	Contractors	10	59%	72%	7	41%	28%	17
	Inspectors	26	72%		10	28%		36
	FDOT	*11*	*73%*		*4*	*27%*		*15*
	non-FDOT	*15*	*71%*		*6*	*29%*		*21*
6	Designers	13	81%		3	19%		16
	FDOT	*5*	*71%*		*2*	*29%*		*7*
	non-FDOT	*8*	*89%*		*1*	*11%*		*9*
	Contractors	13	81%	75%	3	19%	25%	16
	Inspectors	22	69%		10	31%		32
	FDOT	*9*	*69%*		*4*	*31%*		*13*
	non-FDOT	*13*	*68%*		*6*	*32%*		*19*
7	Designers	1	10%		9	90%		10
	FDOT	*0*	*0%*		*4*	*100%*		*4*
	non-FDOT	*1*	*17%*		*5*	*83%*		*6*
	Contractors	2	13%	17%	13	87%	83%	15
	Inspectors	6	21%		22	79%		28
	FDOT	*2*	*22%*		*7*	*78%*		*9*
	non-FDOT	*4*	*21%*		*15*	*79%*		*19*
8	Designers	15	94%		1	6%		16
	FDOT	*7*	*100%*		*0*	*0%*		*7*
	non-FDOT	*8*	*89%*		*1*	*11%*		*9*
	Contractors	9	56%	69%	7	44%	31%	16
	Inspectors	22	63%		13	37%		35
	FDOT	*10*	*71%*		*4*	*29%*		*14*
	non-FDOT	*12*	*57%*		*9*	*43%*		*21*
9	Designers	16	100%		0	0%		16
	FDOT	*7*	*100%*		*0*	*0%*		*7*
	non-FDOT	*9*	*100%*		*0*	*0%*		*9*
	Contractors	11	69%	73%	5	31%	26%	16
	Inspectors	21	62%		13	38%		34
	FDOT	*8*	*67%*		*4*	*33%*		*12*
	non-FDOT	*13*	*59%*		*9*	*41%*		*22*
10	Designers	3	30%		7	70%		10
	FDOT	*2*	*40%*		*3*	*60%*		*5*
	non-FDOT	*1*	*20%*		*4*	*80%*		*5*
	Contractors	3	23%	28%	10	77%	72%	13
	Inspectors	8	30%		19	70%		27
	FDOT	*3*	*33%*		*6*	*67%*		*9*
	non-FDOT	*5*	*28%*		*13*	*72%*		*18*
11	Designers	15	100%		0	0%		15
	FDOT	*8*	*100%*		*0*	*0%*		*8*
	non-FDOT	*7*	*100%*	75%	*0*	*0%*	25%	*7*
	Contractors	10	63%		6	38%		16
	Inspectors	23	70%		10	30%		33

	FDOT	*11*	*79%*		*3*	*21%*		*14*
	non-FDOT	*12*	*63%*		*7*	*37%*		*19*
12	Designers	9	64%		5	36%		14
	FDOT	*3*	*50%*		*3*	*50%*		*6*
	non-FDOT	*6*	*75%*		*2*	*25%*		*8*
	Contractors	7	54%	57%	6	46%	43%	13
	Inspectors	15	56%		12	44%		27
	FDOT	*7*	*70%*		*3*	*30%*		*10*
	non-FDOT	*8*	*47%*		*9*	*53%*		*17*
13	Designers	13	87%		2	13%		15
	FDOT	*5*	*71%*		*2*	*29%*		*7*
	non-FDOT	*8*	*100%*		*0*	*0%*		*8*
	Contractors	12	71%	68%	5	29%	32%	17
	Inspectors	16	57%		12	43%		28
	FDOT	*9*	*75%*		*3*	*25%*		*12*
	non-FDOT	*7*	*44%*		*9*	*56%*		*16*
14	Designers	5	63%		3	38%		8
	FDOT	*3*	*75%*		*1*	*25%*		*4*
	non-FDOT	*2*	*50%*		*2*	*50%*		*4*
	Contractors	4	40%	60%	6	60%	40%	10
	Inspectors	15	68%		7	32%		22
	FDOT	*6*	*67%*		*3*	*33%*		*9*
	non-FDOT	*9*	*69%*		*4*	*31%*		*13*
15	Designers	8	89%		1	11%		9
	FDOT	*4*	*100%*		*0*	*0%*		*4*
	non-FDOT	*4*	*80%*		*1*	*20%*		*5*
	Contractors	13	93%	88%	1	7%	12%	14
	Inspectors	24	86%		4	14%		28
	FDOT	*9*	*82%*		*2*	*18%*		*11*
	non-FDOT	*15*	*88%*		*2*	*12%*		*17*

Q9. Comments on any of the above statements

Table B-5: A+B Commentary on Literature Agreement by Participant Category

Designer Commentary	**Times Noted**
Tough to say A+B does any of these [cited] things	1
Should be used on projects with significant impacts that can benefit by a shortened schedule	1
Incentives applied to reward contractor for using resources (and forgo other income sources) to complete the project quickly	1
Contractor Commentary	
No consistent savings in cost	1
No consistent savings in time	1
Time and Cost work opposite of each other with A+B	1
Allows contractors to bid a project based on their current availability of resources	1
Incentives are too small to motivate a difference between A+B and DBB	1
Weather should not affect A+B *(Weather days granted and contracts are extended)*	1
Reconstruction and rehabilitation projects are typically more dependent upon available resources, while bridges, bridges out of service, lengthy detour projects, and projects with high traffic rely on the key execution of sequential activities and/or long lead times for procurement of materials … and are exposed to more risks related to timely completion	1

Inspector Commentary	
Effective A+B does not necessarily mean improved quality	1
Suited for all projects which the department wants to fast-track	1
Time and quality depend on the contractor. *(Some are motivated to complete on time; others have more projects than available workforce to finish on time.)*	1
Contractor's management is the same as other projects, unless it is largescale	1
Quality of work is the same, not better	1
Contractors do not usually have better quality or work faster. *(Some work ahead of design and often results in rework and slows overall progress.)*	1
Makes contractor work faster but doesn't result in as good a job	1
In most cases improves quality, to avoid rework that can cause delays. But also quality has suffered because they're maximizing production	1
Projects that finish early are usually tied to heavy disincentives	1

Q10. In your opinion, what is the most significant <u>advantage</u> of <u>A+B Bidding</u>?

Table B-6: A+B Noted Advantages by Participant Category

Designer Commentary	Times Noted
Allows quality contractors (with resources) to bid competitively	1
Time savings / timely completion / maintaining project schedule	3
Provides greater focus on time / time aspect comes into play	2
Contractor has ownership of contract time, encouraging early completion	1
Contractor assumes greater responsibility for delays	1
Establishes a reward system for the contractor for getting the work done early	1
Draws significant attention to prioritizing resources during construction	1
Contractor Commentary	
There are no advantages / little significance	2
Cost reduction / lower cost to the owner	2
Time reduction / shorter contract durations / shorter duration for project completion	3
Bid schedules should be better	1
Usually attracts a better quality group of contractors	1
Allows contractor to set contract time based on their resource availability	1
Allows a contractor with the resources to expedite completion, using the time component to their advantage, resulting in reduced impact to traveling public	1
Inspector Commentary	
There are no advantages / little significance	2
Time savings / reduced contract time / compressed construction schedule	6
If no "time" loopholes, project should be done in the most efficient amount of time	1
Innovation sometimes results in lower project bid cost to the Department	1
Contractors make every effort to finish early and earn the bonus	2
Contractor has ownership of contract time, encouraging early completion	1
Contractor has to develop a schedule (and detail out the construction approach)	3
Contractor has to schedule proj. before bidding – understanding issues & employing innov. solns.	1
Contractor is at risk for the contract time instead of the Department	1
Contractor can effectively allocate the necessary resources	1
Motivates contractor to create innovation to expedite construction methods	1
If contractor determines they're not going to earn the bonus, they will look for ways to add contract time to avoid the penalty	1
Department sets contract time based on the "generic contractor". *(Each contractor has specialties that allows for efficiencies in his production, therefore reducing overall contract time.)*	1

Q11. In your opinion, what is the most significant disadvantage of A+B Bidding?

Table B-7: A+B Noted Disadvantages by Participant Category

Designer Commentary	**Times Noted**
Higher bids	1
Reduction in time (or rushing through) causes quality to suffer	4
Reduction in time (or rushing through) causes safety to suffer	1
Reduction in time (or rushing through) causes construction issues (i.e., extensions, claims, etc.)	1
Contractors intentionally bid low on time and money to win the project	1
Contractor's initial schedule is unrealistic, putting a strain on supporting staff	1
Adversarial relationships between contractor (or DB team) and CEI *(regarding schedule days)*	1
Administration of the contract may be tough as the contractor attempts to extend days based on changes which may or may not be justified	1
Contractor Commentary	
There are no disadvantages	1
Reduction in time (or rushing through) causes quality to suffer	1
Contractors intentionally bid low on time and money to win the project	2
Contractor's initial schedule is unrealistic, putting a strain on supporting staff	2
Irresponsible bidding results in a failed project	1
Time extension requests are more on A+B jobs	1
Not suited for fast-paced projects because contract time can vary	1
Projects are never delivered within the time frames due to weather and utility issues	1
Bidding on time is useless –no control over the most influential factors (i.e., weather, utilities)	1
Usually associated with an incentive/disincentive	1
Owner is reluctant to move the completion date for any reason other than hurricanes, even if the delay is caused by additional work	1
Bid dollar amounts are increased proportionally to contract day reduction	1
Increased claims	1
Lack of quality control	1
Confrontation with owner	1
Diminished partnering *(FDOT takes advantage of contractor)*	1
A+B is always a major negative when deciding to bid on advertised projects	1
Least credible of all FDOT delivery methods	1
Inspector Commentary	
There are no disadvantages	2
Reduction in time (or rushing through) causes quality to suffer	2
Contractors intentionally bid low on time and money to win the project	1
Contractors intentionally bid low on time … and then spend time/money/effort in getting additional time for issues	2
Contractors intentionally bid low on time and money to win the project, resulting in construction issues (i.e., requests for time extensions, project claims, etc.)	1
Contractor can be affected by utility conflicts	1
Poor planning by contractor negates savings	1
Adversarial relationships between contractor and CEI *(regarding bonus)*	1
Weather plays a significant role in early completion / causes a lot of time loss	2
No weather days should be granted – contractor should complete the project on time or pay damages. *(Besides a natural disaster, there should be no excuses.)*	1
Increases the risk of claim to the owner	1
Owner changes must be minimized	1
Owner does not factor in the time/cost impact when a ROW agreement is authorized	1
CEIs cannot keep up with all activities when construction pace is increased for the sake of time	1

<u>Lump Sum Contracting</u>

Q12. The following statements have been cited regarding <u>Lump Sum Contracting</u> compared to <u>Design Bid Build</u>. Please indicate if you agree or disagree with the statement, or are unable to judge.

Table B-8: Lump Sum Literature Agreement

#	Question	Agree	Disagree	Unable to Judge	Total Responses
Cost					
1	Contractors may add a greater contingency to their bids	64	16	11	91
		80% of 80	20% of 80		
Time					
2	Reduces time spent measuring quantities	62	22	6	90
		74% of 84	26% of 84		
Quality					
3	Offers owner the best protection	38	40	12	90
		49% of 78	51% of 78		
4	There is a higher demand on design quality	58	25	7	90
		70% of 83	30% of 83		
5	Contractor administration is much easier	55	25	11	91
		69% of 80	31% of 80		
Others					
6	Best suited for simple (activity-wise) jobs	70	12	8	90
		85% of 82	15% of 82		
7	Best implemented when the scope is defined and understood by all parties	85	2	4	91
		98% of 87	2% of 87		
8	Best suited for projects that have well-defined risks	73	13	4	90
		85% of 86	15% of 86		
9	Best suited for projects that have a low risk of unforeseen conditions	76	11	4	91
		87% of 87	13% of 87		
10	Best suited for projects that have a low possibility of change	81	5	5	91
		94% of 86	6% of 86		
11	Best suited for projects when there exists uncertainty in quantity estimates	25	59	6	90
		30% of 84	70% of 84		

Looking solely at the total number of respondents that either agree or disagree with the above statements, and using previously calculated percentages of confirmation (equal or greater than 80% agreement as highly confirmed; 60%-79% agreement as confirmed; 40%-59% agreement as mixed response; 20%-39% agreement as refuted; and less than 20% agreement as highly refuted), the following can be derived from the use of Lump Sum Contracting:

- Statements 1, 6, 7, 8, 9, and 10 are highly confirmed with the literature
- Statements 2, 4, and 5 are confirmed with the literature
- Statement 3 received mixed responses
- Statement 11 refutes the literature
- None of the statements highly refute the literature

Table B-9: Lump Sum Literature Agreement Breakdown by Participant Category

		Agree			Disagree			
#	**Participant**	**Num.**	**Percent.**	**Agree Avg.**	**Num.**	**Percent.**	**Disagree Avg.**	**Total**
1	Designers	22	92%	80%	2	8%	20%	24
	FDOT	*10*	*91%*		*1*	*9%*		*11*
	non-FDOT	*12*	*92%*		*1*	*8%*		*13*
	Contractors	15	83%		3	17%		18
	Inspectors	27	71%		11	29%		38
	FDOT	*8*	*53%*		*7*	*47%*		*15*
	non-FDOT	*19*	*83%*		*4*	*17%*		*23*
2	Designers	16	67%	74%	8	33%	26%	24
	FDOT	*7*	*70%*		*3*	*30%*		*10*
	non-FDOT	*9*	*64%*		*5*	*36%*		*14*
	Contractors	10	56%		8	44%		18
	Inspectors	36	86%		6	14%		42
	FDOT	*15*	*83%*		*3*	*17%*		*18*
	non-FDOT	*21*	*88%*		*3*	*13%*		*24*
3	Designers	10	50%	49%	10	50%	51%	20
	FDOT	*3*	*38%*		*5*	*63%*		*8*
	non-FDOT	*7*	*58%*		*5*	*42%*		*12*
	Contractors	10	56%		8	44%		18
	Inspectors	18	45%		22	55%		40
	FDOT	*11*	*61%*		*7*	*39%*		*18*
	non-FDOT	*7*	*32%*		*15*	*68%*		*22*
4	Designers	16	64%	70%	9	36%	30%	25
	FDOT	*5*	*50%*		*5*	*50%*		*10*
	non-FDOT	*11*	*73%*		*4*	*27%*		*15*
	Contractors	13	76%		4	24%		17
	Inspectors	29	71%		12	29%		41
	FDOT	*14*	*78%*		*4*	*22%*		*18*
	non-FDOT	*15*	*65%*		*8*	*35%*		*23*
5	Designers	15	65%	69%	8	35%	31%	23
	FDOT	*6*	*75%*		*2*	*25%*		*8*
	non-FDOT	*9*	*60%*		*6*	*40%*		*15*
	Contractors	10	63%		6	38%		16
	Inspectors	30	73%		11	27%		41
	FDOT	*13*	*76%*		*4*	*24%*		*17*
	non-FDOT	*17*	*71%*		*7*	*29%*		*24*

6	Designers	21	88%		3	13%		24
	FDOT	*8*	*89%*		*1*	*11%*		*9*
	non-FDOT	*13*	*87%*		*2*	*13%*		*15*
	Contractors	13	76%	85%	4	24%	15%	17
	Inspectors	36	88%		5	12%		41
	FDOT	*16*	*89%*		*2*	*11%*		*18*
	non-FDOT	*20*	*87%*		*3*	*13%*		*23*
7	Designers	26	96%		1	4%		27
	FDOT	*11*	*100%*		*0*	*0%*		*11*
	non-FDOT	*15*	*94%*		*1*	*6%*		*16*
	Contractors	17	94%	98%	1	6%	2%	18
	Inspectors	42	100%		0	0%		42
	FDOT	*18*	*100%*		*0*	*0%*		*18*
	non-FDOT	*24*	*100%*		*0*	*0%*		*24*
8	Designers	22	85%		4	15%		26
	FDOT	*9*	*82%*		*2*	*18%*		*11*
	non-FDOT	*13*	*87%*		*2*	*13%*		*15*
	Contractors	16	89%	85%	2	11%	15%	18
	Inspectors	35	83%		7	17%		42
	FDOT	*14*	*78%*		*4*	*22%*		*18*
	non-FDOT	*21*	*88%*		*3*	*13%*		*24*
9	Designers	25	93%		2	7%		27
	FDOT	*11*	*100%*		*0*	*0%*		*11*
	non-FDOT	*14*	*88%*		*2*	*13%*		*16*
	Contractors	15	83%	87%	3	17%	13%	18
	Inspectors	36	86%		6	14%		42
	FDOT	*18*	*95%*		*1*	*5%*		*19*
	non-FDOT	*18*	*78%*		*5*	*22%*		*23*
10	Designers	25	96%		1	4%		26
	FDOT	*11*	*100%*		*0*	*0%*		*11*
	non-FDOT	*14*	*93%*		*1*	*7%*		*15*
	Contractors	16	89%	94%	2	11%	6%	18
	Inspectors	40	95%		2	5%		42
	FDOT	*18*	*100%*		*0*	*0%*		*15*
	non-FDOT	*22*	*92%*		*2*	*8%*		*24*
11	Designers	5	21%		19	79%		24
	FDOT	*1*	*10%*		*9*	*90%*		*10*
	non-FDOT	*4*	*29%*		*10*	*71%*		*14*
	Contractors	5	28%	30%	13	72%	70%	18
	Inspectors	15	36%		27	64%		42
	FDOT	*7*	*39%*		*11*	*61%*		*18*
	non-FDOT	*8*	*33%*		*16*	*67%*		*24*

Q13. Comments on any of the above statements

Table B-10: Lump Sum Commentary on Literature Agreement by Participant Category

Designer Commentary	**Times Noted**
Changes by the owner should be compensable even in Lump Sum contracting	1
Contractor suffers with the same quantity issues with the added exposure of cost overruns – this transfer of risk is not appropriate	1
Well suited for all types of scopes as well as level of risk	1
Carries the same risk factor as with Design Build	1
Contractor will hold the design team responsible for errors	1
Greater chance of error in a Design Build contract than Lump Sum due to unrealistic schedules	1
Contractor Commentary	
In general, all cited literature are from a contractor's perspective	1
Greater risk of a contractor missing some quantity at the bid stage	1
Contractors should not be asked to accept the risk of events they cannot control	1
"Contingency" should mean the bidder analyzes Lump Sum work more thoroughly, studies how all the parts fit together and adds costs accordingly	1
"Contingency" should not mean the bidder throws more money at unknowns	1
Lump Sum bidding is about precision (for both the designer and the contractor) and that is why we favor it	1
Appropriate for all types of projects – there is nothing worse than bidding a pay item project based on a lazy design	1
FDOT should always define the risks accurately	1
No reason to avoid Lump Sum in favor of pay items because even pay item unit prices get adjusted for unforeseen conditions	1
Reduction in time spent measuring quantities is only true with an accurate set of plans	1
Contract administration is only easier with an accurate set of plans	1
Department spends less time measuring, but the burden has been shifted to the contractor	1
Likelihood of additional costs in the bid for project staff to track the project's quantities	1
Design quality is important for the Department in order to minimize risks with additional cost and time	1
Contract administration should be less involved … but administration staff requests unnecessary documents and spends time providing extensive justification for the contractor's pay estimate	1
Inspector Commentary	
Accurate bid quantities are necessary to avoid unneeded changes that would require negotiation of a unit price for payment	1
Statements are broad and simplistic relative to the complexity inherent in many modern infrastructure systems	1
Many Design Build contracts are Lump Sum so I disagree with it reducing time spend measuring quantities as opposed to DB	1
Provides good quality but dependent on type of work, workforce quality and skill, and terms of the contract	1
Regarding design quality – higher premium on design constructability than on completeness of plans and spec because constructability can work in favor of either contractor or owner and is often not determinable until work has started	1
FDOT is one of the more progressive DOT agencies regarding to investment in engineering time and fees to reach proper design quality for Lump Sum contracts	1
Regarding contract administration – primary advantage is ease in administration in regard to payment; however, Lump Sum payments lead to increased administration and oversight to prevent shortcuts to quality control in construction	1

Regarding being best suited for simple jobs – primary factor for success of a job (for both simple and complex projects) was prequalification of the contractors and requirements for proper planning to be put into place. *(Planning would consist of a proper CEI organization, requirements for QA/QC plans, means and methods plans, and requirements for the contractor to have a robust organization to handle general conditions and quality control relevant to the type of work planned.)*	1
Regarding knowledge of scope, risks, unforeseen conditions, and possibility of change – even simple projects may experience these problems.	1
Risks should be well defined and understood, but there should be planned mechanisms in place for payment and mitigation ahead of time versus waiting to negotiate from scratch after the fact	1
Pre-planned payment schemes for items such as delay, overhead costs, equipment, should be evaluated ahead of the work and placed in the contract ahead of time so bidders/proposers understand the risks and compensation available to address unknowns so the proper planning can be put into place	1
Regarding Lump Sum versus unit-price – easier to deal with unit prices for uncertain quantity estimates but this assumes relatively minor changes in quantities	1
Regarding Lump Sum versus unit-price – for projects with substantial uncertainty in quantity, better to go with Lump Sum with proper mechanisms in place to deal with that risk ahead of when the issue is encountered	1
Regarding Lump Sum versus unit-price – other risks besides quantity variations that are not suited for unit price including as access, traffic control, production rates, etc.	1
Regarding Lump Sum versus unit-price – uncertainties in quantities often leads contractors to over-weigh unit items in order to cover unanticipated costs	1
Unit pricing has essentially become the base upon which contractors have tried to convert the project to a total cost recovery as they rarely recovered the cost associated with the work	1
Offers owner best protection if the design team follows all design criteria/contract documents. *(When there exists a site condition/property owner issue that needs a design change, it becomes an added cost to the owner.)*	1
Regarding uncertainty in quantity estimates – you should always have a real good idea about what you are getting for your money	1
Best option if you are unsure of the quantities and have no way to find out what they are	1
Uncertainty should be a measured item that way the Department gets the best price – when risk is shifted to the contractor the costs go up	1
Can be used on high risk projects, as long as the plans designate the risk or potential. *(Risks are always present on all projects and usually cost money in the end no matter which contract method used.)*	1

Q14. In your opinion, what is the most significant advantage of Lump Sum Contracting?

Table B-11: Lump Sum Noted Advantages by Participant Category

Designer Commentary	Times Noted
Reduced time and effort for client contracting services	1
Reduced time and effort to track quantities	2
Easier contract administration *(also from a construction viewpoint)*	2
Encourages contractor to expedite completion	1
Speed of contract completion is superior to conventional design build projects	1
Simplifies the process	1
Simplifies invoicing process *(but only if it's truly Lump Sum pricing)*	1
Design team is independent of the contractor and not subject to contractor influence	1
Quality of the product	1
Contractor takes on additional risk – reducing the exposure for the designer/owner	1

Contractor takes on quantity liability	1
Costs identified at bidding	1
Contractor Commentary	
There are no significant advantages	1
Reduced administrative costs / reduced paperwork	2
Reduced work and cost expended by the state and contractor	1
Reduced time and effort to track quantities / take measurements	2
Reduced disputes over project quantities	1
Reduced contract administration *(for the department)*	1
Easier contract administration *(less pay item interpretation issues)*	1
Easier on the owner	1
Less risk for the department	1
No quantity discrepancies	1
Forces bidder to analyze project issues thoroughly	1
Encourages higher quality design and scopes	1
Uncomplicated bid forms	1
Clear and Concise scope of work	1
Greater responsibility for the contractor to efficiently manage the project	1
Inspector Commentary	
Easier/reduced contract administration	3
Reduced administrative costs	5
Reduced administration time	3
Reduced final estimate documentation	1
Reduced time and effort to track/calculate/reconcile quantities	6
Reduced opportunity for quantities to be haggled over	1
Reduced CEI costs	2
Reduced effort at project closeout	1
Easier final estimate closeout	2
Easier to manage	1
Easier payment processing / easier monthly invoicing	2
Field personnel can focus on quality instead of quantity	2
Contractor less likely to argue over missing pay-items	1
Contractor takes on risk (away from owner)	1
Contractor takes on responsibility	1
Lower risk to owner for cost increases	1
Saves time and effort for inspection	1
Saves time and effort for project administrator/manager	2
Pay based on percentage of work completed	1
Most contractors prefer a Lump Sum project	1
Best suited for well-defined scopes and simpler jobs	1
Best suited for straight forward projects with little to no changes *(and little to no subsurface work)*	1
Ensure the right project type is chose, and all RFPs are followed	1
FDOT still takes significant measurements in case of a dispute instead of making the contractor prove the quantity issues	1

Q15. In your opinion, what is the most significant disadvantage of Lump Sum Contracting?

Table B-12: Lump Sum Noted Disadvantages by Participant Category

Designer Commentary	**Times Noted**
Contractors inflate bids	1
Additional time required to produce 100% plans	1
Increases claims by the contractor	1
Significant transfer of risk to the bidders	1
Increases effort by the CEI inspector	1
Results in items that do not meet owner's expectations	1
Not having unit prices to estimate additional work	1
Difficulty assessing responsibility and work outside SOS	1
Adversarial relationship between contractor and designer *(regarding delays or discrepancies)*	1
Negotiating change orders	1
Disagreements / potential lawsuits	1
FDOT process to release projects for construction is too involved and lengthy … they feel the need to endlessly review the plans … and while oversight is important to ensure the scope is being met, the means and methods to build the project should be left to the contractor and designer	1
Quantity accuracy must be precise – designer needs to quantify quantities to come up with an official ad estimate	1
Additional risk results in higher bid prices	1
Additional risk results in disputes for scope items where the contractor and the designer have made different assumptions	1
Contractor Commentary	
Heavily dependent on a solid design	1
Scope and quantity need to be clear on bid documents	1
Quantity risks are shifted from owner to contractor	1
Quantity discrepancies from plan errors or unforeseen conditions / inaccurate plans resulting in contract changes / change in site conditions or interpretation of plans	4
Changes not clearly identified will result in additional time and/or cost	1
Additional paperwork involved with project issues / changes to plan require a change order	2
Makes it tougher on the contractor	1
Owner is paying for risk / contingencies if nothing occurs	1
Time spent educating CEI personnel that there is no contingency for items not included in plans or scope documents	1
Not a disadvantage, but contractors prefer pay item contracts (they can bid pay item quantities, enabling to bid more projects per letting) … FDOT should employ more lump sum bidding	1
Inspector Commentary	
Unclear scope and work lead to unnecessary changes/delays/conflict	1
Defining scope of work and what's required *(between the Department and contractor)*	2
Necessity for quality plans *(no easy method to make additions)*	1
Poor (or ill-defined) design / plans must be accurate and contain all pertinent details	2
Contractors bid higher to cover unknowns/risk	1
Contractors' added "safety net" decreases if competition in the industry is high	1
Contractors will "split-hairs" over scope interpretations to seek additional compensation	1
Contractors always looking for loopholes to not provide required work *(if the plans or specs are unclear)*	1
Contractors do not read all RFP requirements and other contract documents / overlook items of work if they're not completely thorough	2
Plan notes are needed to make the contractor aware of the required work	1
Unknowns / unforeseen conditions	3

Utility Coordination	1
Quality issues / less quality products / risk of degrading quality by contractors	3
Perception of owners that LS work requires less independent oversight, reporting, and quality assurance	1
Calculating costs for changes/extra work is more difficult / no easy negotiating of extra work *(since lump sum has no established costs for items)*	3
No established contract unit prices	1
Keeping track of quantities for monthly payments with the schedule of values	1
Cost Saving Initiatives are used for reduction of work *(making adjustments for materials difficult)*	1
Extra work, design errors, or changes need to be negotiated and paid out of a Work Order or a Supplemental Agreement	3
Note should be added that a certain percentage over-run is included in the LS payment *(plans provide quantity matrix for bidding … but difficult to pay a LS based on a LS matrix with quantities)*	1
Effort required to add work that would normally be an existing item overrun	2

No Excuse Bonus

Q16. The following statements have been cited regarding No Excuse Bonus compared to Design Bid Build. Please indicate if you agree or disagree with the statement, or are unable to judge.

Table B-13: No Excuse Bonus Literature Agreement

#	Question	Agree	Disagree	Unable to Judge	Total Responses
Cost					
1	Often results in increased costs in order to cover unexpected delay risks	35	19	36	90
		65% of 54	35% of 54		
2	Bonus must outweigh use of additional resources that are typically required to finish early	59	5	26	90
		92% of 64	8% of 64		
3	Graduated bonuses are preferred to all-or-nothing bonuses	49	6	34	89
		89% of 55	11% of 55		
4	Contractors typically share bonuses with subcontractors to motivate their cooperation	11	33	45	89
		25% of 44	75% of 44		
Time					
5	Results in faster project completion	47	19	23	89
		71% of 66	29% of 66		
6	Requires expending additional resources in order to finish early	55	10	23	88
		85% of 65	15% of 65		
7	Utility schedules are critical to these types of projects	67	2	21	90
		97% of 69	3% of 69		
Quality					
8	Provides continual motivation throughout the project duration	42	24	24	90
		64% of 66	36% of 66		
Others					
9	Promotes efficient construction	35	26	28	89
		57% of 61	43% of 61		
10	Reduces disruption to the general public	38	27	25	90
		58% of 65	42% of 65		
11	Best suited for projects with large budgets	29	27	33	89
		52% of 56	48% of 56		
12	Best suited for projects with long durations	36	25	29	90

		59% of 61	41% of 61		
13	Best suited for projects that can be constructed outside hurricane season	29	30	31	90
		49% of 59	51% of 59		
14	Best suited for projects with high traffic	36	25	29	90
		59% of 61	41% of 61		
15	Best suited for high visibility projects	43	24	22	89
		64% of 67	36% of 67		
16	Best suited for emergency situations	42	21	27	90
		67% of 63	33% of 63		

Looking solely at the total number of respondents that either agree or disagree with the above statements, and using previously calculated percentages of confirmation (equal or greater than 80% agreement as highly confirmed; 60%-79% agreement as confirmed; 40%-59% agreement as mixed response; 20%-39% agreement as refuted; and less than 20% agreement as highly refuted), the following can be derived from the use of No Excuse Bonus:

- Statements 2, 3, 6, and 7 are highly confirmed with the literature
- Statements 1, 5, 8, 15, and 16 are confirmed with the literature
- Statements 9, 10, 11, 12, 13, and 14 received mixed responses
- Statement 4 refutes the literature
- None of the statements highly refute the literature

Table B-14: No Excuse Bonus Literature Agreement Breakdown by Participant Category

		Agree			Disagree			
#	**Participant**	**Num.**	**Percent.**	**Agree Avg.**	**Num.**	**Percent.**	**Disagree Avg.**	**Total**
1	Designers	9	82%		2	18%		11
	FDOT	*2*	*67%*		*1*	*33%*		*3*
	non-FDOT	*7*	*88%*		*1*	*13%*		*8*
	Contractors	11	73%	65%	4	27%	35%	15
	Inspectors	15	54%		13	46%		28
	FDOT	*5*	*56%*		*4*	*44%*		*9*
	non-FDOT	*10*	*53%*		*9*	*47%*		*19*
2	Designers	13	87%		2	13%		15
	FDOT	*5*	*83%*		*1*	*17%*		*6*
	non-FDOT	*8*	*89%*		*1*	*11%*		*9*
	Contractors	17	100%	92%	0	0%	8%	17
	Inspectors	29	91%		3	9%		32
	FDOT	*12*	*100%*		*0*	*0%*		*12*
	non-FDOT	*17*	*85%*		*3*	*15%*		*20*
3	Designers	12	100%		0	0%		12
	FDOT	*4*	*100%*		*0*	*0%*		*4*
	non-FDOT	*8*	*100%*	89%	*0*	*0%*	11%	*8*
	Contractors	13	93%		1	7%		14
	Inspectors	24	83%		5	17%		29

	FDOT	*8*	*73%*		*3*	*27%*		*11*
	non-FDOT	*16*	*89%*		*2*	*11%*		*18*
4	Designers	2	25%		6	75%		8
	FDOT	*0*	*0%*		*3*	*100%*		*3*
	non-FDOT	*2*	*40%*		*3*	*60%*		*5*
	Contractors	7	50%	25%	7	50%	75%	14
	Inspectors	2	9%		20	91%		22
	FDOT	*1*	*14%*		*6*	*86%*		*7*
	non-FDOT	*1*	*7%*		*14*	*93%*		*15*
5	Designers	14	82%		3	18%		17
	FDOT	*6*	*86%*		*1*	*14%*		*7*
	non-FDOT	*8*	*80%*		*2*	*20%*		*10*
	Contractors	10	67%	71%	5	33%	29%	15
	Inspectors	23	68%		11	32%		34
	FDOT	*11*	*85%*		*2*	*15%*		*13*
	non-FDOT	*12*	*57%*		*9*	*43%*		*21*
6	Designers	14	82%		3	18%		17
	FDOT	*4*	*67%*		*2*	*33%*		*6*
	non-FDOT	*10*	*91%*		*1*	*9%*		*11*
	Contractors	14	88%	85%	2	13%	15%	16
	Inspectors	27	84%		5	16%		32
	FDOT	*11*	*92%*		*1*	*8%*		*12*
	non-FDOT	*16*	*80%*		*4*	*20%*		*20*
7	Designers	17	94%		1	6%		18
	FDOT	*7*	*100%*		*0*	*0%*		*7*
	non-FDOT	*10*	*91%*		*1*	*9%*		*11*
	Contractors	17	100%	97%	0	0%	3%	17
	Inspectors	33	97%		1	3%		34
	FDOT	*13*	*100%*		*0*	*0%*		*13*
	non-FDOT	*20*	*95%*		*1*	*5%*		*21*
8	Designers	12	71%		5	29%		17
	FDOT	*3*	*60%*		*2*	*40%*		*5*
	non-FDOT	*9*	*75%*		*3*	*25%*		*12*
	Contractors	9	53%	64%	8	47%	36%	17
	Inspectors	21	66%		11	34%		32
	FDOT	*11*	*85%*		*2*	*15%*		*13*
	non-FDOT	*10*	*53%*		*9*	*47%*		*19*
9	Designers	8	57%		6	43%		14
	FDOT	*3*	*60%*		*2*	*40%*		*5*
	non-FDOT	*5*	*56%*		*4*	*44%*		*9*
	Contractors	11	69%	57%	5	31%	43%	16
	Inspectors	16	52%		15	48%		31
	FDOT	*7*	*54%*		*6*	*46%*		*13*
	non-FDOT	*9*	*50%*		*9*	*50%*		*18*
10	Designers	11	65%		6	35%		17
	FDOT	*4*	*67%*		*2*	*33%*		*6*
	non-FDOT	*7*	*64%*	59%	*4*	*36%*	42%	*11*
	Contractors	9	60%		6	40%		15
	Inspectors	18	55%		15	45%		33
	FDOT	*8*	*62%*		*5*	*38%*		*13*

	non-FDOT	*10*	*50%*		*10*	*50%*		*20*
11	Designers	6	50%		6	50%		12
	FDOT	*4*	*80%*		*1*	*20%*		*5*
	non-FDOT	*2*	*29%*		*5*	*71%*		*7*
	Contractors	5	38%	52%	8	62%	48%	13
	Inspectors	18	58%		13	42%		31
	FDOT	*6*	*50%*		*6*	*50%*		*12*
	non-FDOT	*12*	*63%*		*7*	*37%*		*19*
12	Designers	9	64%		5	36%		14
	FDOT	*5*	*83%*		*1*	*17%*		*6*
	non-FDOT	*4*	*50%*		*4*	*50%*		*8*
	Contractors	8	53%	59%	7	47%	41%	15
	Inspectors	19	59%		13	41%		32
	FDOT	*7*	*54%*		*6*	*46%*		*13*
	non-FDOT	*12*	*63%*		*7*	*37%*		*19*
13	Designers	5	36%		9	64%		14
	FDOT	*4*	*80%*		*1*	*20%*		*5*
	non-FDOT	*1*	*11%*		*8*	*89%*		*9*
	Contractors	10	63%	49%	6	38%	51%	16
	Inspectors	14	48%		15	52%		29
	FDOT	*3*	*27%*		*8*	*73%*		*11*
	non-FDOT	*11*	*61%*		*7*	*39%*		*18*
14	Designers	9	64%		5	36%		14
	FDOT	*5*	*83%*		*1*	*17%*		*6*
	non-FDOT	*4*	*50%*		*4*	*50%*		*8*
	Contractors	8	47%	59%	9	53%	41%	17
	Inspectors	19	63%		11	37%		30
	FDOT	*9*	*69%*		*4*	*31%*		*13*
	non-FDOT	*10*	*59%*		*7*	*41%*		*17*
15	Designers	11	61%		7	39%		18
	FDOT	*5*	*63%*		*3*	*38%*		*8*
	non-FDOT	*6*	*60%*		*4*	*40%*		*10*
	Contractors	10	59%	64%	7	41%	36%	17
	Inspectors	22	69%		10	31%		32
	FDOT	*9*	*69%*		*4*	*31%*		*13*
	non-FDOT	*13*	*68%*		*6*	*32%*		*19*
16	Designers	12	67%		6	33%		18
	FDOT	*7*	*88%*		*1*	*13%*		*8*
	non-FDOT	*5*	*50%*		*5*	*50%*		*10*
	Contractors	8	53%	67%	7	47%	33%	15
	Inspectors	22	73%		8	27%		30
	FDOT	*9*	*75%*		*3*	*25%*		*12*
	non-FDOT	*13*	*72%*		*5*	*28%*		*18*

Q17. Comments on any of the above statements

Table B-15: No Excuse Bonus Commentary on Literature Agreement by Participant Category

Designer Commentary	**Times Noted**
Regarding utility schedules being critical – highly variable and project specific	1
Regarding continual motivation throughout project duration – continual motivation (afforded by additional compensation) may have a negative impact on project quality	1
Regarding disruption to the public – disruption is unavoidable	1
Regarding suitability for high traffic projects – not always … good whenever there's a reason to complete project by a certain date	1
Regarding suitability for high visibility projects – not always true … could be as simple as access to a critical business	1
Contractor Commentary	
Not a preferable method – bonuses are not achievable for the project conditions	1
Regarding suitability of construction outside hurricane season – difficult as this method is used on projects that last longer than 2 years *(hard to control time of year the project starts … letting schedule is driven by funding which changes often)*	1
Inspector Commentary	
Reduced contract administration cost is an indirect benefit	1
Should be beneficial for a wide variety of project sizes	1
More difficult for owner to add desired extra work or upgrades during the project	1
Emergency situations are a terrible time to use No-Excuse Bonus – too many unknowns	1
Graduated bonuses should not be limited to time only … can be tied to construction quality, schedule, cost and claim performance and lack of public disruption	1
Contractors often place larger contingencies on work to ensure schedule performance to receive bonus	1
Contingency need rises as schedule becomes more critical	1
Ineffective if expected costs are going to exceed the bonus	1
Owner must fully understand project to devise an effective bonus system	1
Bonus contract is counter-productive to construction quality and public convenience – contractor has incentive to cut corners and pursue the bonus	1
Bonus contract better with well-defined and limited scope	1
Contingencies, and bonus can be well defined so as not to be ineffective	1
High traffic project runs the risk of public disruptions … high visibility projects are often complex and unsuited for No Excuse Bonus	1
Often a public perception element to contractors receiving bonus payments	1
Utility coordination is important	1
Utility and permit issues are the most common impact to a project's decline	1
For emergency situations, task is well defined and public disruption is the primary concern over the risk of overcompensation	1
For emergency situations, spending time to analyze risk potential and mitigation is not possible for the owner/agency … contractors are more adept at assessing such risks and will be motivated under these conditions	1

Q18. In your opinion, what is the most significant advantage of No Excuse Bonus?

Table B-16: No Excuse Bonus Noted Advantages by Participant Category

Designer Commentary	Times Noted
Decreases time / accelerates project schedule	2
Projects completed on, or close to initial schedule	1
Motivates contractor to finish early *(to receive the bonus)*	2
Motivates to complete key elements by certain date	1
Contractor Commentary	
There are no known advantages	1
Opportunity to maximize profit on a project	1
Typically minimal discussion regarding moving out the No Excuse Bonus date	1
Motivation/incentive for early completion	2
Positive impact on cooperation levels of project participants … all usually respectful of the bonus deadline … improving cooperation *(even if they do not directly benefit)*	1
No significant impacts if a project goes well … no significant time impacts, little to no unforeseen work, and if completed early, there can be mutual benefit for all parties	1
Inspector Commentary	
There are no known advantages	1
Bidders less likely to take chances on completion	1
Establishes a known time for completion	2
Faster completion time / speeds up construction time / motivates contractor to complete early	4
Maintains contractor on schedule	1
Does not encourage early completion	
Contractor has an investment in completing on time	1
Contractor must plan ahead for all unforeseen conditions	1
Contractor responsible for all construction-related issues / burden of completion on contractor	2
Quality is improved	1
Higher impact to traveling public during construction	1
Decreased impacts to the public / minimized traffic disruption	2
Milestones well defined	1
Communication is improved	1
Incentivizes contractor to maintain production provided the bonus is significant to balance the additional resource costs	1
Used in relatively low dollar critical situations and to achieve single goal or relatively simple contracts	1
Less opportunity for prolonged excuses	1

Q19. In your opinion, what is the most significant disadvantage of No Excuse Bonus?

Table B-17: No Excuse Bonus Noted Disadvantages by Participant Category

Designer Commentary	Times Noted
Increases project cost	1
Potential impact on quality / contractor will expedite construction by sacrificing performance / contractor willing to accept construction deficiency in exchange for greater comp. w/bonus	3
Bonus is not usually more than the additional resource cost to finish early	1
All or nothing can be very de-motivational if the bonus isn't graduated	1
They always find an excuse	1
If bonuses cannot be met projects tend to take the maximum amount of time allowed to compete	1
Contractor Commentary	

There are no significant disadvantages	1
Drains resources from other projects	1
Subject to outside influences (i.e., weather, utilities, etc.)	2
Contractors pursuing bonus are penalized when confronted with unforeseen conditions	1
Owner reluctant to move bonus date even if additional work is added to the contract *(for which the contractor has no control)*	1
Deadlines are unrealistic	1
No motivation for CEI	1
Increases probability of claims	1
FDOT take advantage of contractor	1
Owner processes and timelines for approvals and reviews have a huge impact	1
Department uses it as leverage to entice contractors to forego claims and accept the risk of additional costs, irrespective of obtaining the bonus at the end of the project	1
Inspector Commentary	
Quality of work declines because contractors feel they are being rushed	1
Requires heavier contract administration to protect the bonus date	1
Risk of quality control failures / quality may suffer as contractor is in a hurry to complete work	5
Risk of public disruption and public perception / traveling public can be disrupted in order for the contractor to not need an excuse	2
Could get too costly for unforeseen conditions / little room to deal with unforeseen issues	2
Deficient work must be identified timely	1
Major utility conflicts	1
Only used for extremely large contracts	1
Contractor will increase price to cover costs in cases that they are not able to meet bonus date	1
Contractor may use bonus as "bargaining chip" to recover from events that are not owner-caused	1
Contractor should be required in the specification to declare in the bid or at least at preconstruction, his intentions of earning the bonus *(if not pursued, the spec should require them to track this completion milestone as a critical activity in the schedule)*	1
Contractor constantly trying to find ways to bend contract to meet bonus	1
Additional claims would develop if bonus is not achieved	1
Tension between contractor and project oversight personnel (CEI)	2
Contractor that misses bonus will abandon accelerated schedule	1
Method does not always mean “no excuse” – issues can become political	1
Contractors that do not earn the bonus are allowed to dispute their case	1
Client must make it clear that there are potential unknowns and contractor must take that into account when bidding this work	1
Everyone on the project must understand that there significant cost for any delays in responding to RFIs, RFCs, and unforeseen conditions	1
Owner should anticipate additional costs and get commitments from the EOR to get rapid response and for the EOR and utilities to attend the weekly progress meetings	1
Everyone must work together to meet the deadline	1
Important for the owner to have very experienced and aggressive CEI services	1
No incentive for the CEI to work hard to have a project get finished early	1
Contractors expect to get the bonus regardless of the time and schedules achieved	1
Used as a claim settlement tool (i.e., bonus paid and claims considered resolved by contractor)	1
Contractor will file more claims for time that would have otherwise not been filed just to have on record reasons for extending bonus	1
Slow or delayed responses to contractor's request for information or clarification can more easily delay work progress as scheduled	1

Incentive/Disincentive

Q20. The following statements have been cited regarding Incentive/Disincentive compared to Design Bid Build. Please indicate if you agree or disagree with the statement, or are unable to judge.

Table B-18: Incentive/Disincentive Literature Agreement

#	Question	Agree	Disagree	Unable to Judge	Total Responses
Cost					
1	Often results in increased construction costs	25	33	30	88
		43% of 58	57% of 58		
2	Reduces CEI costs due to shorter schedule	28	32	27	87
		47% of 60	53% of 60		
Time					
3	Unforeseen conflicts require timelier responses than with traditional projects	58	11	17	86
		84% of 69	16% of 69		
4	Often results in utility conflicts	19	37	29	85
		34% of 56	66% of 56		
5	Projects are completed on time or early	47	14	25	86
		77% of 61	23% of 61		
Quality					
6	Often results in reduced quality	23	38	25	86
		38% of 61	62% of 61		
7	Increases the number of, and value of, change orders	25	35	26	86
		42% of 60	58% of 60		
8	Increases need for field inspections	38	25	23	86
		60% of 63	40% of 63		
Others					
9	Best suited for high volume (traffic-wise) projects	51	13	21	85
		80% of 64	20% of 64		
10	Best suited for large projects	42	23	21	86
		65% of 65	35% of 65		
11	Best suited for interstate projects	33	26	26	85
		56% of 59	44% of 59		
12	Best suited for projects that will cause severe economic impact on local businesses	63	5	18	86
		93% of 68	7% of 68		

13	Best suited for projects that will impair emergency service success for a prolonged amount of time	57	9	20	86
		86% of 66	14% of 66		
14	Best suited for projects where the safety of road users or construction workers is at risk	43	19	24	86
		69% of 62	31% of 62		
15	Best suited for projects that require lengthy detours on poorly maintained roads	44	18	23	85
		71% of 62	29% of 62		
16	Best suited for projects that severely impact traffic on main arteries	57	8	21	86
		88% of 65	12% of 65		
17	Frequently used with A+B bidding	40	11	33	84
		78% of 51	22% of 51		

Looking solely at the total number of respondents that either agree or disagree with the above statements, and using previously calculated percentages of confirmation (equal or greater than 80% agreement as highly confirmed; 60%-79% agreement as confirmed; 40%-59% agreement as mixed response; 20%-39% agreement as refuted; and less than 20% agreement as highly refuted), the following can be derived from the use of Incentive/Disincentive:

- Statements 3, 9, 12, 13, and 16 are highly confirmed with the literature
- Statements 5, 8, 10, 14, 15, and 17 are confirmed with the literature
- Statements 1, 2, 7, and 11 received mixed responses
- Statements 4, and 6 refute the literature
- None of the statements highly refute the literature

Table B-19: Incentive/Disincentive Literature Agreement Breakdown by Participant Category

		Agree			Disagree			
#	**Participant**	**Num.**	**Percent.**	**Agree Avg.**	**Num.**	**Percent.**	**Disagree Avg.**	**Total**
1	Designers	7	54%	43%	6	46%	57%	13
	FDOT	*3*	*100%*		*0*	*0%*		*3*
	non-FDOT	*4*	*40%*		*6*	*60%*		*10*
	Contractors	6	43%		8	57%		14
	Inspectors	12	39%		19	61%		31
	FDOT	*7*	*54%*		*6*	*46%*		*13*
	non-FDOT	*5*	*28%*		*13*	*72%*		*18*
2	Designers	5	38%	47%	8	62%	53%	13
	FDOT	*1*	*33%*		*2*	*67%*		*3*
	non-FDOT	*4*	*40%*		*6*	*60%*		*10*
	Contractors	6	46%		7	54%		13
	Inspectors	17	50%		17	50%		34
	FDOT	*6*	*46%*		*7*	*54%*		*13*
	non-FDOT	*11*	*52%*		*10*	*48%*		*21*
3	Designers	16	80%	84%	4	20%	16%	20

	FDOT	*8*	*100%*		*0*	*0%*		*8*
	non-FDOT	*8*	*67%*		*4*	*33%*		*12*
	Contractors	13	93%		1	7%		14
	Inspectors	29	83%		6	17%		35
	FDOT	*11*	*79%*		*3*	*21%*		*14*
	non-FDOT	*18*	*86%*		*3*	*14%*		*21*
4	Designers	5	38%		8	62%		13
	FDOT	*2*	*50%*		*2*	*50%*		*4*
	non-FDOT	*3*	*33%*		*6*	*67%*		*9*
	Contractors	3	25%	34%	9	75%	66%	12
	Inspectors	11	35%		20	65%		31
	FDOT	*3*	*25%*		*9*	*75%*		*12*
	non-FDOT	*8*	*42%*		*11*	*58%*		*19*
5	Designers	12	80%		3	20%		15
	FDOT	*5*	*100%*		*0*	*0%*		*5*
	non-FDOT	*7*	*70%*		*3*	*30%*		*10*
	Contractors	8	67%	77%	4	33%	23%	12
	Inspectors	27	79%		7	21%		34
	FDOT	*12*	*92%*		*1*	*8%*		*13*
	non-FDOT	*15*	*71%*		*6*	*29%*		*21*
6	Designers	8	50%		8	50%		16
	FDOT	*3*	*50%*		*3*	*50%*		*6*
	non-FDOT	*5*	*50%*		*5*	*50%*		*10*
	Contractors	0	0%	38%	13	100%	62%	13
	Inspectors	15	47%		17	53%		32
	FDOT	*6*	*46%*		*7*	*54%*		*13*
	non-FDOT	*9*	*47%*		*10*	*53%*		*19*
7	Designers	5	38%		8	62%		13
	FDOT	*3*	*60%*		*2*	*40%*		*5*
	non-FDOT	*2*	*25%*		*6*	*75%*		*8*
	Contractors	3	23%	42%	10	77%	58%	13
	Inspectors	17	50%		17	50%		34
	FDOT	*7*	*50%*		*7*	*50%*		*14*
	non-FDOT	*10*	*50%*		*10*	*50%*		*20*
8	Designers	8	57%		6	43%		14
	FDOT	*3*	*43%*		*4*	*57%*		*7*
	non-FDOT	*5*	*71%*		*2*	*29%*		*7*
	Contractors	5	38%	60%	8	62%	40%	13
	Inspectors	25	69%		11	31%		36
	FDOT	*8*	*57%*		*6*	*43%*		*14*
	non-FDOT	*17*	*77%*		*5*	*23%*		*22*
9	Designers	14	78%		4	22%		18
	FDOT	*7*	*88%*		*1*	*13%*		*8*
	non-FDOT	*7*	*70%*		*3*	*30%*		*10*
	Contractors	10	71%	80%	4	29%	20%	14
	Inspectors	27	84%		5	16%		32
	FDOT	*12*	*86%*		*2*	*14%*		*14*
	non-FDOT	*15*	*83%*		*3*	*17%*		*18*
10	Designers	10	56%	65%	8	44%	35%	18
	FDOT	*6*	*86%*		*1*	*14%*		*7*

	non-FDOT	*4*	*36%*		*7*	*64%*		*11*
	Contractors	9	64%		5	36%		14
	Inspectors	23	70%		10	30%		33
	FDOT	*10*	*77%*		*3*	*23%*		*13*
	non-FDOT	*13*	*65%*		*7*	*35%*		*20*
11	Designers	9	56%		7	44%		16
	FDOT	*4*	*80%*		*1*	*20%*		*5*
	non-FDOT	*5*	*45%*		*6*	*55%*		*11*
	Contractors	6	46%	56%	7	54%	44%	13
	Inspectors	18	60%		12	40%		30
	FDOT	*7*	*58%*		*5*	*42%*		*12*
	non-FDOT	*11*	*61%*		*7*	*39%*		*18*
12	Designers	18	95%		1	5%		19
	FDOT	*7*	*100%*		*0*	*0%*		*7*
	non-FDOT	*11*	*92%*		*1*	*8%*		*12*
	Contractors	12	86%	93%	2	14%	7%	14
	Inspectors	33	94%		2	6%		35
	FDOT	*14*	*100%*		*0*	*0%*		*14*
	non-FDOT	*19*	*90%*		*2*	*10%*		*21*
13	Designers	15	79%		4	21%		19
	FDOT	*7*	*88%*		*1*	*13%*		*8*
	non-FDOT	*8*	*73%*		*3*	*27%*		*11*
	Contractors	13	93%	86%	1	7%	14%	14
	Inspectors	29	88%		4	12%		33
	FDOT	*11*	*85%*		*2*	*15%*		*13*
	non-FDOT	*18*	*90%*		*2*	*10%*		*20*
14	Designers	7	47%		8	53%		15
	FDOT	*3*	*50%*		*3*	*50%*		*6*
	non-FDOT	*4*	*44%*		*5*	*56%*		*9*
	Contractors	10	71%	69%	4	29%	31%	14
	Inspectors	26	79%		7	21%		33
	FDOT	*9*	*69%*		*4*	*31%*		*13*
	non-FDOT	*17*	*85%*		*3*	*15%*		*20*
15	Designers	12	71%		5	29%		17
	FDOT	*5*	*71%*		*2*	*29%*		*7*
	non-FDOT	*7*	*70%*		*3*	*30%*		*10*
	Contractors	9	69%	71%	4	31%	29%	13
	Inspectors	23	72%		9	28%		32
	FDOT	*8*	*62%*		*5*	*38%*		*13*
	non-FDOT	*15*	*79%*		*4*	*21%*		*19*
16	Designers	15	83%		3	17%		18
	FDOT	*7*	*88%*		*1*	*13%*		*8*
	non-FDOT	*8*	*80%*		*2*	*20%*		*10*
	Contractors	11	79%	88%	3	21%	12%	14
	Inspectors	31	94%		2	6%		33
	FDOT	*13*	*93%*		*1*	*7%*		*14*
	non-FDOT	*18*	*95%*		*1*	*5%*		*19*
17	Designers	13	93%		1	7%		14
	FDOT	*6*	*86%*	78%	*1*	*14%*	22%	*7*
	non-FDOT	*7*	*100%*		*0*	*0%*		*7*

Contractors	10	83%		2	17%		12
Inspectors	17	68%		8	32%		25
FDOT	*7*	*64%*		*4*	*36%*		*11*
non-FDOT	*10*	*71%*		*4*	*29%*		*14*

Q21. Comments on any of the above statements

Table B-20: Incentive/Disincentive Commentary on Literature Agreement by Participant Category

Designer Commentary	**Times Noted**
CEI costs may be increased due to rapid pace needing additional inspectors	1
Contractor Commentary	
Should not change the amount of inspection, but may affect CEI's scheduling	1
Inspection duration may be shortened, but amount of inspectors needed will increase	1
Acceleration of time may increase CEI costs due to added overtime	1
Inspector Commentary	
Best suited for intermediate deadlines (milestones)	1
Contractor set on getting the incentive could cut corners to save time	1
Early completion depends if the contractor wants the bonus (and if he risked a high bid to do so)	1
Owner response timeliness is critical as any delay creates claim situations with the contractors	1
Utility conflicts are not an issue with proper planning and working with the companies	1
Combining A+B with Incentive Disincentive can obscure the goal of A+B	1
Reduced quality depends on contractor – but up to the inspection team to ensure quality of work is achieved	1
Terms must be carefully crafted and be complementary to each other	1
Require larger, more sophisticated contractors *(they carry greater risk in the form of the disincentive component which is above and beyond the actual construction risks encountered)*	1
Public perception issues are reduced as compared to no excuse bonus contracts because of the disincentive risk portion of the contract	1
Public officials and industry insiders are often loathe in applying disincentives (much as with liquidated damages in DBB contracts) unless they are offsetting other contractor claim amounts	1

Q22. In your opinion, what is the most significant advantage of Incentive/Disincentive?

Table B-21: Incentive/Disincentive Noted Advantages by Participant Category

Designer Commentary	**Times Noted**
Time may be reduced / project completed earlier	2
Projects with major effects on motoring public will be completed earlier – reducing user cost delays	1
Provide a means for additional monies to be recouped by the contractor and team	1
Disincentive portion is an advantage – but typically not utilized since the project schedules are increased due to rain delays or unforeseen conditions	1
Contractor given both a positive and negative financial catalyst to complete as early as possible	1
Reward efficiency and innovation	1
Contractor Commentary	
Expedited project delivery / incentive for contractor to complete project early / motivates contractor / decreases project construction days	4
Motivation without the pressure is better than the pressure created by the A+B	1
Positive impact on the mindset of project participants – but not as effective as a no excuse bonus	1

Opportunity to shorten project duration without an "all or nothing" no-excuse bonus *(even if max incentive not achieved, contractor can still realize revenue to make committing additional resources economically feasible)*	1
Inspector Commentary	
Contractor can still earn a portion of bonus even if missing the max bonus	2
Contractor, seeking to earn the bonus does not get "punished in full" for a short delay	1
Contractor earns extra money	1
Encourages contractor to put all resources to work to get the full incentive	1
Motivates contractors to finish ahead of time / disincentives result in timely project completion / Helps contractor focus on an early completion	4
Keeps contractor focused on completing project / keeps the contractor on schedule	2
Early completion / shortens construction time / more work in a shorter time period	3
Better suited for meeting intermediate milestones that are critical to the project rather than overall project	1
Works well if tracked properly and CEI/Contractor address time each week	1
Specific goals and restraints can be targeted with an I/D clause which provides the owner agency greater control over the desired outcome	1
Good for high volume traffic roads	1

Q23. In your opinion, what is the most significant disadvantage of Incentive/Disincentive?

Table B-22: Incentive/Disincentive Noted Disadvantages by Participant Category

Designer Commentary	**Times Noted**
Incentive/disincentives usually are not equal	1
Disincentive portion is never utilized and when it is the impact to the contractor is negligible	1
Increases project cost	1
Contractor responsible for completing the project on schedule *(advantage of completing early should only effect his profit margin)*	1
Quality may suffer / Contractor may accept a deficiency (at a reduced pay or pay a penalty) in exchange for the financial benefit of the incentive (or to avoid a greater penalty via the disincentive)	3
Contractor Commentary	
There are no significant disadvantages	1
Relationship with owner/CEI may be adversely affected	1
Accurate/realistic calculation of time to allow the contractor opportunity to improve	1
Contractors bid higher if they do not think they can meet the incentive (just to not lose if charged a disincentive)	1
Combining I/D and A+B is “double dipping” – time already reduced to the minimum for the A+B bid so that the potential of incurring the disincentive is high	1
Increases probability of claims	1
Owner processes and timelines for approvals and reviews have a huge impact	1
FDOT take advantage of contractor	1
FDOT does not administer them correctly	1
Inspector Commentary	
There are no significant disadvantages	1
Contractors bid low during the A+B bidding process in order to get the contract, thus creating unrealistic construction schedules	1
Inclement weather can affect the bonus date / best suited for projects not impacted by weather	2
Increase in claims submitted	1
Costly for unforeseen issues or items not clearly identified in contract documents	1

Unforeseen conflicts result in timelier responses and disputes	1
Quality suffers / contractor is in a hurry to complete work	2
Utility conflicts	1
Premium on quality project plans … contractor always seeking additional days because they have a dollar value attached to the additional days … project personnel must make criteria for granting additional days clear at the pre-bid and pre-construction conferences.	1
Negotiated cost for extra work is higher than conventional projects	1
Coordination becomes the most important aspect of the project *(due to amount of work occurring at one time on the project site)*	1
Final acceptance is subjective *(minor/small unfinished items may be completed after final acceptance in field to achieve max incentive)*	1
Increased cost for inspection and project oversight due to long hours and multiple crews/operations	1
When combined with A+B the contractor can manipulate the schedule to serve both innovative methods often creating a disadvantage for travelers	1
Additional incentive on profit and cost side for contractors to file for delay associated claim	1
Requires close observation and administration to ensure incentives/disincentives are properly being applied	1
No incentive for the contract time if contractor isn't looking for a bonus	1
Contractors tend to start citing delays and claims once they fall into disincentive	1
Contractor may consider disincentive situation if they start to lose time or they do not allocate resources efficiently – the project becomes a game of posturing for contractor claims	1
Opens the door to argue claims against both methods successfully	1
More costly to tax payers since the project is more expensive to start with (besides the bonus money spent as well)	1

<u>A+B and Incentive/Disincentive</u>

Q24. In the past 10 years, for highway construction projects greater than $1 million, the FDOT has completed more jobs using A+B and Incentive/Disincentive together (A+B & I/D) than by using A+B alone.

The following statements are in regard to the use of <u>A+B and Incentive/Disincentive, together</u>. Please indicate if you agree or disagree with the statement, or are unable to judge.

Table B-23: A+B and Incentive/Disincentive Literature Agreement

#	Question	Agree	Disagree	Unable to Judge	Total Responses
1	It is more effective to pair the two methods together	40	16	29	85
		71% of 56	29% of 56		
2	A+B & I/D should always be paired together	26	30	29	85
		46% of 56	54% of 56		
3	A+B & I/D provides greater cost savings than A+B alone	23	23	39	85
		50% of 46	50% of 46		
4	A+B & I/D provides greater time savings than A+B alone	39	15	31	85
		72% of 54	28% of 54		
5	A+B & I/D provides greater quality than A+B alone	11	37	37	85
		23% of 48	77% of 48		

Looking solely at the total number of respondents that either agree or disagree with the above statements, and using previously calculated percentages of confirmation (equal or greater than 80% agreement as highly confirmed; 60%-79% agreement as confirmed; 40%-59% agreement as mixed response; 20%-39% agreement as refuted; and less than 20% agreement as highly refuted), the following can be derived from the use of A+B and Incentive/Disincentive:

- None of the statements highly confirm the literature
- Statements 1 and 4 confirm the literature
- Statements 2 and 3 received mixed responses
- Statement 5 refutes the literature
- None of the statements highly refute the literature

Table B-24: A+B and Incentive/Disincentive Literature Agreement Breakdown by Participant Category

#	Participant		Agree			Disagree			Total
			Num.	Percent.	Agree Avg.	Num.	Percent.	Disagree Avg.	
1	Designers		12	80%	71%	3	20%	29%	15
		FDOT	*5*	*83%*		*1*	*17%*		*6*
		non-FDOT	*7*	*78%*		*2*	*22%*		*9*
	Contractors		6	43%		8	57%		14
	Inspectors		22	81%		5	19%		27
		FDOT	*8*	*73%*		*3*	*27%*		*11*
		non-FDOT	*14*	*88%*		*2*	*13%*		*16*

2	Designers	6	43%		8	57%		14
	FDOT	*2*	*40%*		*3*	*60%*		*5*
	non-FDOT	*4*	*44%*		*5*	*56%*		*9*
	Contractors	4	29%	46%	10	71%	54%	14
	Inspectors	16	57%		12	43%		28
	FDOT	*4*	*40%*		*6*	*60%*		*10*
	non-FDOT	*12*	*67%*		*6*	*33%*		*18*
3	Designers	5	56%		4	44%		9
	FDOT	*1*	*25%*		*3*	*75%*		*4*
	non-FDOT	*4*	*80%*		*1*	*20%*		*5*
	Contractors	4	33%	50%	8	67%	50%	12
	Inspectors	14	56%		11	44%		25
	FDOT	*4*	*40%*		*6*	*60%*		*10*
	non-FDOT	*10*	*67%*		*5*	*33%*		*15*
4	Designers	9	75%		3	25%		12
	FDOT	*4*	*80%*		*1*	*20%*		*5*
	non-FDOT	*5*	*71%*		*2*	*29%*		*7*
	Contractors	7	54%	72%	6	46%	28%	13
	Inspectors	23	79%		6	21%		29
	FDOT	*8*	*73%*		*3*	*27%*		*11*
	non-FDOT	*15*	*83%*		*3*	*17%*		*18*
5	Designers	2	25%		6	75%		8
	FDOT	*0*	*0%*		*3*	*100%*		*3*
	non-FDOT	*2*	*40%*		*3*	*60%*		*5*
	Contractors	3	21%	23%	11	79%	77%	14
	Inspectors	6	23%		20	77%		26
	FDOT	*0*	*0%*		*10*	*100%*		*10*
	non-FDOT	*6*	*38%*		*10*	*63%*		*16*

Q25. Comments on any of the above statements

Table B-25: A+B and Incentive/Disincentive Commentary on Literature Agreement by Participant Category

Designer Commentary	**Times Noted**
(No commentary from Designers)	
Contractor Commentary	
A+B ruins all things it is associated with	1
Inspector Commentary	
I/D clauses are better for intermediate milestones rather than for full project durations	1
I/D clauses can be used for material quality issues (i.e., the new FDOT ride standards and asphalt quality standards)	1
Better to set multiple performance goals by criteria than only by schedule (especially with regard to complex projects)	1

Q26. In your opinion, what is the most significant <u>advantage</u> of using <u>A+B and Incentive/Disincentive, together</u>?

Table B-26: A+B and Incentive/Disincentive Noted Advantages by Participant Category

Designer Commentary	**Times Noted**
Maintains cost portion lower *(with the A+B aspect)*	1
Money that may be more readily available	1
Significant time savings	1
Contractor has the incentive to complete the project early	1
Contractor has "ownership" of the schedule and project budget	1
Significantly increases contractor's responsibility to finish as early as possible *(especially with high profile/cost projects)*	1
Contractor Commentary	
Greater motivation to accurately bid time	1
Greater motivation to think through production rates	1
Inspector Commentary	
Less time spent during the bid process	1
Allows contractor to provide a more accurate time frame *(which he can more readily meet)*	1
Contractor becomes more competitive in their bidding process	1
Expedited/early construction completion	2
Greater work completed in short amount of time	1
Combination has greatest effect in shortening project duration	1
Additional time reduction during construction based on the I/D language in the contracts	1

Q27. In your opinion, what is the most significant <u>disadvantage</u> of using <u>A+B and Incentive/Disincentive, together</u>?

Table B-27: A+B and Incentive/Disincentive Noted Disadvantages by Participant Category

Designer Commentary	**Times Noted**
No real significant disadvantage, other than potential quality impacts	1
Confusion that is created under this bidding method	1
Quality suffers as time and cost are the primary focus of the contractor's efforts	1
Contractor Commentary	
Compounding pressure	1
I/D should be used sparingly – raises the contractor's bid due to the risk of receiving a disincentive	1
Not all A+B project needs an I/D	1
Inspector Commentary	
Increases cost *(since risk is shifted to the contractor in setting time and having a competitive bid)*	1
Contractors bid aggressively, putting them at a disadvantage to get the full incentive	1
When "incentive per day" value is greater than "road user cost", bids ("B") have higher schedules	1
Contracts have unrealistic construction schedules	1
Contractor is always battling for days	1
Construction crews are in a hurry to get the work done	1
Adversarial relationship between contractor and owner/CEI *(due to costs associated with days)*	1
Minimal incentive for CEI to work toward meeting the incentive goal	1
Owner fails to appreciate CEI's effort to meet the goal	1
Significantly greater contract administration is required *(on the part of the owner)*	1
Greater contract administration increases CEI contract cost *(requiring FDOT to revise contracting approach and scope of CEI services and compensation)*	1

Alternative contracting methods may require FDOT to revise internal and external procedures, and policies to take advantage of the efficiencies which do not conform to traditional	1
Unforeseen issues can be costly	1
Effective inspection is paramount to a successful project	1

Design Build

Q28. The following statements have been cited regarding Design Build compared to Design Bid Build. Please indicate if you agree or disagree with the statement, or are unable to judge.

Table B-28: Design Build Literature Agreement

#	Question	Agree	Disagree	Unable to Judge	Total Responses
Cost					
1	Unit costs are lower	32	36	16	84
		47% of 68	53% of 68		
2	Cost growth is lower	36	24	25	85
		60% of 60	40% of 60		
Time					
3	Construction speed is faster	51	22	12	85
		70% of 73	30% of 73		
4	Delivery speed is faster	60	16	9	85
		79% of 76	21% of 76		
5	Sensitive to schedule delays	56	15	14	85
		79% of 71	21% of 71		
6	Time savings is the greatest advantage to this contracting method	47	27	11	85
		64% of 74	36% of 74		
Quality					
7	Promotes design flexibility	69	8	8	85
		90% of 77	10.% of 77		
8	Provides contractor flexibility	68	9	8	85
		88% of 77	12% of 77		
9	Promotes optimization of project design	65	10	9	84
		87% of 75	13% of 75		
10	Promotes optimization of construction methods	65	9	11	85
		88% of 74	12% of 74		
11	Reduces owner's/agency's control of design	45	30	9	84
		60% of 75	40% of 75		
12	Increases risk for the design professional	57	16	11	84
		78% of 73	22% of 73		
13	Contract administration is similar	37	31	15	83
		54% of 68	46% of 68		

Others					
14	Not ideal for projects with high quantities of ROW and utilities	45	21	17	83
		68% of 66	32% of 66		
15	Better relationship between agency and contractor than between agency and design professional	30	36	17	83
		45% of 66	55% of 66		
16	There is a lower level of contention between the owner and the contractor	36	31	16	83
		54% of 67	46% of 67		
17	There is a lower level of contention between the owner and the designer	31	33	19	83
		48% of 64	52% of 64		
18	Greater familiarity with project contractors than with those obtained through a bidding process	59	8	15	82
		88% of 67	12% of 67		

Looking solely at the total number of respondents that either agree or disagree with the above statements, and using previously calculated percentages of confirmation (equal or greater than 80% agreement as highly confirmed; 60%-79% agreement as confirmed; 40%-59% agreement as mixed response; 20%-39% agreement as refuted; and less than 20% agreement as highly refuted), the following can be derived from the use of Design Build:

- Statements 7, 8, 9, 10, and 18 are highly confirmed with the literature
- Statements 2, 3, 4, 5, 6, 11, 12, and 14 are confirmed with the literature
- Statements 1, 13, 15, 16, and 17 received mixed responses
- None of the statements refute the literature
- None of the responses highly refute the literature

Table B-29: Design Build Literature Agreement Breakdown by Participant Category

			Agree			Disagree			
#	**Participant**		**Num.**	**Percent.**	**Agree Avg.**	**Num.**	**Percent.**	**Disagree Avg.**	**Total**
1	Designers		11	52%	47%	10	48%	53%	21
		FDOT	*6*	*75%*		*2*	*25%*		*8*
		non-FDOT	*5*	*38%*		*8*	*62%*		*13*
	Contractors		3	21%		11	79%		14
	Inspectors		18	55%		15	45%		33
		FDOT	*10*	*83%*		*2*	*17%*		*12*
		non-FDOT	*8*	*38%*		*13*	*62%*		*21*
2	Designers		15	75%	60%	5	25%	40%	20
		FDOT	*6*	*75%*		*2*	*25%*		*8*
		non-FDOT	*9*	*75%*		*3*	*25%*		*12*
	Contractors		4	33%		8	67%		12
	Inspectors		17	61%		11	39%		28
		FDOT	*7*	*78%*		*2*	*22%*		*9*

	non-FDOT	*10*	*53%*		*9*	*47%*		*19*
3	Designers	21	88%		3	13%		24
	FDOT	*11*	*100%*		*0*	*0%*		*11*
	non-FDOT	*10*	*77%*		*3*	*23%*		*13*
	Contractors	8	57%	70%	6	43%	30%	14
	Inspectors	22	63%		13	37%		35
	FDOT	*8*	*53%*		*7*	*47%*		*15*
	non-FDOT	*14*	*70%*		*6*	*30%*		*20*
4	Designers	24	96%		1	4%		25
	FDOT	*12*	*100%*		*0*	*0%*		*12*
	non-FDOT	*12*	*92%*		*1*	*8%*		*13*
	Contractors	10	71%	79%	4	29%	21%	14
	Inspectors	26	70%		11	30%		37
	FDOT	*13*	*87%*		*2*	*13%*		*15*
	non-FDOT	*13*	*59%*		*9*	*41%*		*22*
5	Designers	18	82%		4	18%		22
	FDOT	*8*	*80%*		*2*	*20%*		*10*
	non-FDOT	*10*	*83%*		*2*	*17%*		*12*
	Contractors	9	64%	79%	5	36%	21%	14
	Inspectors	29	83%		6	17%		35
	FDOT	*11*	*79%*		*3*	*21%*		*14*
	non-FDOT	*18*	*86%*		*3*	*14%*		*21*
6	Designers	18	72%		7	28%		25
	FDOT	*11*	*100%*		*0*	*0%*		*11*
	non-FDOT	*7*	*50%*		*7*	*50%*		*14*
	Contractors	9	64%	64%	5	36%	37%	14
	Inspectors	20	57%		15	43%		35
	FDOT	*8*	*53%*		*7*	*47%*		*15*
	non-FDOT	*12*	*60%*		*8*	*40%*		*20*
7	Designers	24	92%		2	8%		26
	FDOT	*11*	*92%*		*1*	*8%*		*12*
	non-FDOT	*13*	*93%*		*1*	*7%*		*14*
	Contractors	10	71%	90%	4	29%	10%	14
	Inspectors	35	95%		2	5%		37
	FDOT	*15*	*100%*		*0*	*0%*		*15*
	non-FDOT	*20*	*91%*		*2*	*9%*		*22*
8	Designers	23	88%		3	12%		26
	FDOT	*11*	*92%*		*1*	*8%*		*12*
	non-FDOT	*12*	*86%*		*2*	*14%*		*14*
	Contractors	10	71%	88%	4	29%	12%	14
	Inspectors	35	95%		2	5%		37
	FDOT	*15*	*100%*		*0*	*0%*		*15*
	non-FDOT	*20*	*91%*		*2*	*9%*		*22*
9	Designers	22	85%		4	15%		26
	FDOT	*9*	*75%*		*3*	*25%*		*12*
	non-FDOT	*13*	*93%*		*1*	*7%*		*14*
	Contractors	11	85%	87%	2	15%	13%	13
	Inspectors	32	89%		4	11%		36
	FDOT	*13*	*93%*		*1*	*7%*		*14*
	non-FDOT	*19*	*86%*		*3*	*14%*		*22*

10	Designers	23	96%		1	4%		24
	FDOT	*9*	*90%*		*1*	*10%*		*10*
	non-FDOT	*14*	*100%*		*0*	*0%*		*14*
	Contractors	11	79%	88%	3	21%	12%	14
	Inspectors	31	86%		5	14%		36
	FDOT	*14*	*93%*		*1*	*7%*		*15*
	non-FDOT	*17*	*81%*		*4*	*19%*		*21*
11	Designers	16	62%		10	38%		26
	FDOT	*8*	*67%*		*4*	*33%*		*12*
	non-FDOT	*8*	*57%*		*6*	*43%*		*14*
	Contractors	4	31%	60%	9	69%	40%	13
	Inspectors	25	69%		11	31%		36
	FDOT	*10*	*67%*		*5*	*33%*		*15*
	non-FDOT	*15*	*71%*		*6*	*29%*		*21*
12	Designers	24	92%		2	8%		26
	FDOT	*10*	*83%*		*2*	*17%*		*12*
	non-FDOT	*14*	*100%*		*0*	*0%*		*14*
	Contractors	8	62%	78%	5	38%	22%	13
	Inspectors	25	74%		9	26%		34
	FDOT	*10*	*67%*		*5*	*33%*		*15*
	non-FDOT	*15*	*79%*		*4*	*21%*		*19*
13	Designers	7	35%		13	65%		20
	FDOT	*4*	*44%*		*5*	*56%*		*9*
	non-FDOT	*3*	*27%*		*8*	*73%*		*11*
	Contractors	6	46%	54%	7	54%	46%	13
	Inspectors	24	69%		11	31%		35
	FDOT	*13*	*87%*		*2*	*13%*		*15*
	non-FDOT	*11*	*55%*		*9*	*45%*		*20*
14	Designers	19	83%		4	17%		23
	FDOT	*6*	*67%*		*3*	*33%*		*9*
	non-FDOT	*13*	*93%*		*1*	*7%*		*14*
	Contractors	9	69%	68%	4	31%	32%	13
	Inspectors	17	57%		13	43%		30
	FDOT	*7*	*54%*		*6*	*46%*		*13*
	non-FDOT	*10*	*59%*		*7*	*41%*		*17*
15	Designers	9	41%		13	59%		22
	FDOT	*4*	*44%*		*5*	*56%*		*9*
	non-FDOT	*5*	*38%*		*8*	*62%*		*13*
	Contractors	5	45%	46%	6	55%	55%	11
	Inspectors	16	48%		17	52%		33
	FDOT	*6*	*46%*		*7*	*54%*		*13*
	non-FDOT	*10*	*50%*		*10*	*50%*		*20*
16	Designers	9	45%		11	55%		20
	FDOT	*4*	*50%*		*4*	*50%*		*8*
	non-FDOT	*5*	*42%*		*7*	*58%*		*12*
	Contractors	7	54%	54%	6	46%	46%	13
	Inspectors	20	59%		14	41%		34
	FDOT	*9*	*64%*		*5*	*36%*		*14*
	non-FDOT	*11*	*55%*		*9*	*45%*		*20*
17	Designers	6	29%	48%	15	71%	52%	21

		FDOT	*2*	*25%*		*6*	*75%*		*8*
		non-FDOT	*4*	*31%*		*9*	*69%*		*13*
	Contractors		4	40%		6	60%		10
	Inspectors		21	64%		12	36%		33
		FDOT	*8*	*62%*		*5*	*38%*		*13*
		non-FDOT	*13*	*65%*		*7*	*35%*		*20*
18	Designers		18	86%		3	14%		21
		FDOT	*9*	*100%*		*0*	*0%*		*9*
		non-FDOT	*9*	*75%*		*3*	*25%*		*12*
	Contractors		12	92%	88%	1	8%	12%	13
	Inspectors		29	88%		4	12%		33
		FDOT	*13*	*93%*		*1*	*7%*		*14*
		non-FDOT	*16*	*84%*		*3*	*16%*		*19*

Q29. Comments on any of the above statements

Table B-30: Design Build Commentary on Literature Agreement by Participant Category

Designer Commentary	**Times Noted**
EOR or design team in a position to "serve two masters" *(especially when working for the FDOT as a prime – can't argue with the department for fear of future retribution)*	1
Conflict between parties *(especially the designer when trying to resolve issues)*	1
Design flexibility and optimization possible only if FDOT requires the standards and not their preferences *(including changing alignments that still meet the scope/traffic)*	1
Ineffective if owner needs to control design	1
Contract administration is similar to DBB after the project goes to construction	1
ROW acquisition and utility coordination is more challenging	1
Overall advantages are worth the aggravation associated with ROW and utility conflicts	1
Contractor Commentary	
Regarding lower unit costs – largely due to less than 100% design plans	1
Regarding faster construction speed – only when construction time is involved in the evaluation and scoring of technical proposal	1
Regarding lower level of contention between owner and designer – the designer's income still comes from CEI services and design of DB projects	1
Contract administration is simple because it is a lump sum price	1
Provides contractor several tools to work around delays	1
Design consultants are more flexible in their design-build efforts … but FDOT is frequently less flexible in interpreting design standards than on standard contracts	1
ROW and utility contracts can benefit from DB, if FDOT does their homework	1
FDOT needs to invest considerable energy into preparing the scope *(if RFP is sloppy, conflicts between contractor and owner will arise)*	1
Inspector Commentary	
Unit costs typically controlled deign parameters, often fixed by the agency (i.e., highway design standards are not waived)	1
Unit costs only change significantly when DB teams are allowed to propose alternative materials or standards	1
Cost growth with regard to construction is often the same due to design/construction contingency worked into the DB proposal versus possibly a lower bid cost being received to start	1
Greater emphasis on owner to know and communicate important project aspects	1
Optimal project design should provide the most value to the owner rather than meeting minimum requirements to optimize contractor's interests	1

Designer will often provide drawings or make changes to benefit contractor and not the project as a whole	1
Design costs may be lowered due to decreased procurement and design periods for a project over the classical DBB process	1
Savings are primarily in the form of reduced escalation costs and reduced design fee due to duration of the design period	1
Designer flexibility is with regard to the contractor's viewpoint	1
Creates pressures on the designer to provide a low cost design that may not provide for the lowest life cycle cost to the owner	1
Shifts much of the DBB risk of design defects to a consultant under time pressures not inherent in a DBB environment	1
Design consultant is least able to financially address error and omissions or other design drawing defects	1
Contract administration is similar to DBB, but often more costly as the owner needs to become familiar with the scope of the design which is often finished immediately prior to construction and often after the fact which requires higher levels of oversight and often more experienced personnel	1
DBB and DB contracts both encounter delays in disputes over utilities and contractual issues	1
Relationships are more governed by the philosophies and practices of the owners, contractors, and designers than the contracting methods used	1
Regarding construction speed, delivery speed and time savings – time savings comes from not having to select a designer, having it designed, and then putting it out to bid	1
Regarding contractor flexibility – the contractor must still construct in accordance to standards/specs/contract documents	1
Regarding owner/agency reduction in design control – the designer still submits to the owner's demands	1
Designer must perform due diligence on existing utilities	1
Regarding better relationships between owner/agency and contractors – contractors do not like running into issues as the owner will usually refer the contractor to the designer	1
Greater familiarity with project contractors (versus with DBB) is not necessarily the case	
FDOT is a very prescriptive agency – they have issue with simply allowing the DB firm to meet predetermined project goal and quality requirements	1
FDOT uses the DB process as a tool to move projects forward when funds become available rather than determining the best projects and giving the concept plans the best preparation possible.	1
FDOT treats DB concept plans as 30% when they are not in fact at 30%	1

Q30. In your opinion, what is the most significant advantage of Design Build?

Table B-31: Design Build Noted Advantages by Participant Category

Designer Commentary	**Times Noted**
Reduced design time	1
Speeds up construction initiation *(but not necessarily construction completion)*	2
Speeds up project delivery	1
Innovation / promotes creativity	4
Tailored design to contractor's means and methods	1
Knowledge of how project shall be built – no guessing at means and methods	1
Designer, contractor, and owner collaboration *(to resolve issues)*	2
Smaller project issues resolved within the DB team without escalation or owner involvement	1
Reduces financial risk to the owner	1
Cost savings	1

Substantial savings (by the department) when comparing the entire project cost from inception, permitting, design and construction	1
Improved constructability by allowing the contractor early involvement in design	2
Schedule savings by allowing construction process to begin while design still underway	2
Fewer impacts to the motoring public	1
Contractor Commentary	
Overall cost savings *(due to more efficient design)*	1
Overall time savings *(for design plus construction)*	1
Reduced project delivery to the public	1
Selection process	1
Owner gets the facility delivered sooner than through conventional means	1
Innovation / creative and innovative design	1
Contractor has greater control over design and constructability of the project	1
Less project issues	1
Inspector Commentary	
Cost savings	1
Time savings / faster delivery method	5
Reduces overall project time *(and procurement process)* from planning to completion	3
Flexibility in design	1
Reduces risk to the owner	1
Places risk/liability on the contractor *(instead of the owner / and as long as the scope is clear)*	4
Allows for greater innovation	1
Better quality work – can select the DB team based on their proposals instead by low bid alone	1
Administration	1
More efficient construction	1
No claims for plan errors or omissions	1
QC and material preferences are the responsibility of the DB firm, yet are often the bulk of the intermediate plan comments	1
Reduces contract modifications adding work	1
Contractor teams up with designer to deliver the project, thus reducing owner's responsibilities with the design process / facilitates a working relationship between contractor and designer	2
Contractor and designer take responsibility in areas that would be owner-caused on a conventional project	1
Designers and contractors should combine efforts in relation to the assets of the contractor	1
FDOT often treats DB plan submittals as DBB submittals – rather than determining if the design meets the concept and staying out of the way	1
Current FDOT procedures require the DB firm to complete the design (90%) before starting the project	1
Starting early is the contractor's risk, but also his advantage when D/B is combined with A+B	1

Q31. In your opinion, what is the most significant <u>disadvantage</u> of <u>Design Build</u>?

Table B-32: Design Build Noted Disadvantages by Participant Category

Designer Commentary	Times Noted
Time design project manager devotes to a DB seems double what a conventional project requires	1
Design conservatism is reduced or eliminated	1
Design quality suffers *(satisfying contractor first, and owner second)*	1
Engineer has the least reward and highest risk *(risk pushed to contractor who pushes it to engineering firm)*	2

Backlash on designers for contractor decisions / If method is not understood by contractor and designer, designer usually relegated to a "sub-contractor" and is blamed for anything that goes wrong	2
Risk for both the engineer and contractor	1
Designer caught between contractor and owner financially, design-wise, schedule-wise, etc.	1
Designer caught between contractor and owner often compromising design criteria and standards or compromises the owner's future liability	1
Design professional works for contractor and can damage relationship with owner	1
Owner's inability to not be involved	1
Owner forced to contractually accept a substandard product because focus is on innovation and cost reduction as opposed to satisfying the long-term needs of the owner	1
Outcome is solely driven by contractor's bid	1
Product (especially MOT) may be different than owner normally receives	1
Component submittals are difficult to keep organized	1
Reviewing/filtering vast amount of submittals/alterations and comparing to original RFP submittal	1
Holding contractor accountable to original proposal	1
When FDOT tries to administer the contract like a normal design contract	1
When FDOT tries to gain more time by developing short delivery schedules	1
Department should investigate a Best Value selection where team is selected based on qualification and approach; then sits down with the owner to negotiate price	1
Teams with highest technical scores are not being selected on because the contractor simply chooses to "buy" a project … owner (and taxpayer) is not receiving the best value project	1
In beginning, contractors and designers were on equal footing and designers were held in high regard … now design professionals have been commoditized … little leverage for design team when acting as a sub to the contractor and Department	1
Contractor Commentary	
Missing details in the RFP	1
Risks for increased cost and schedule are greater due to less detail from design documents used to prepare bids	1
Projects risks not equitably distributed amongst stakeholders / department wants to share in savings post award but not participate in overruns	2
Projects are hard to get and require unusual amounts of effort	1
Issues relating to scoring and shortlists are complex and a constant source of dissatisfaction within the industry	1
Seemingly biased or inconsistent evaluations	1
Lack of control over utility relocations and permit acquisition by contractor *(in DBB, the department would delay bidding until these concerns are addressed)*	1
FDOT actively solicits feedback about procurement issues and they should continue to do so because of the obvious benefits of this delivery method	1
Inspector Commentary	
Additional time spent reading and interpreting the RFP	1
Higher cost due to shift of risk (but it may outweigh cost of paying for separate design)	1
RFP has to be well written / poor RFP will result in owner getting something he did not want	3
RFP has too many responsibilities without a clear procedure established by the owner	1
Contract document requirements	1
Greater risks of poor life cycle cost performance	1
Designers placed in situations where engineers at risk to encounter the ethical dilemma of increasing risk to the public and the public treasury in the future due to immediate cost and schedule demands	1
Public may not receive best alternative since contractor controls design and may eliminate components from the original PD&E phase	1

DB Team tries to cut corners at every opportunity	1
Contractor's incentive to under-design to reduce construction costs	1
New contractors not fully understanding their role	1
ROW acquisition by owner if necessary	1
Utility owners expect DB team to adjust design so existing utilities do not have to be adjusted	1
Utilities use tight contract schedule to their benefit (which may not benefit the department)	1
Unforeseen conditions or scope creep	1
Owner receives minimal design standards	1
Supplemental (change orders) are much higher in cost versus DBB	1
Design time increased (and construction time decreased) when owner requests/requires design changes *(to a design already meeting all contract document requirements)*	1
Department should spend more and review more to ensure design plans meet the requirements of the RFP *(in DBs designer is in a sub-contractor's role to the prime contractor who retains fiduciary and contracting control)*	
FDOT does not understand the process – the key is to spend time on concept and allow DB firm to fulfill the concept *(FDOT is set up to review designs, not develop true concepts … DB concepts differ from PD&E plans and 30% plans … true concept plans must have a vision of the final/future needs and convey this concept to the D/B firms)*	1
Intent of requested project or design best practices are not required or enforceable	1

Appendix C: Survey Data Acquisition Breakdown

Appendix C includes a detailed breakdown of the projects in Dataset A by district offices. This information is provided solely for the benefit of the FDOT in observing the distribution of work throughout the state.

Figures C-1 and C-2 provide a graphical representation of the total number of alternative contracting projects, showing the number comparison between districts, and percentage distribution for the entire state. As evident from both figures, District 1 (Southwest Florida) has the most number of projects, followed by District 5 (Central Florida), District 2 (Northeast Florida), District 4 (Southeast Florida), District 3 (Northwest Florida), District 6 (South Florida), District 7 (West Central Florida), and District 8 (Turnpike).

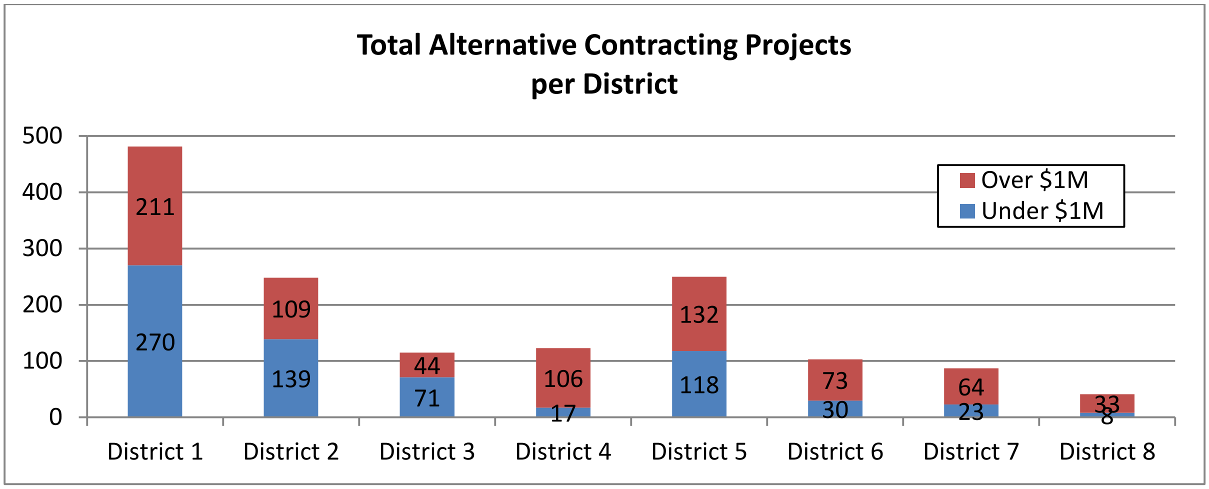

Figure C-1: Total Alternative Contracting Projects per District

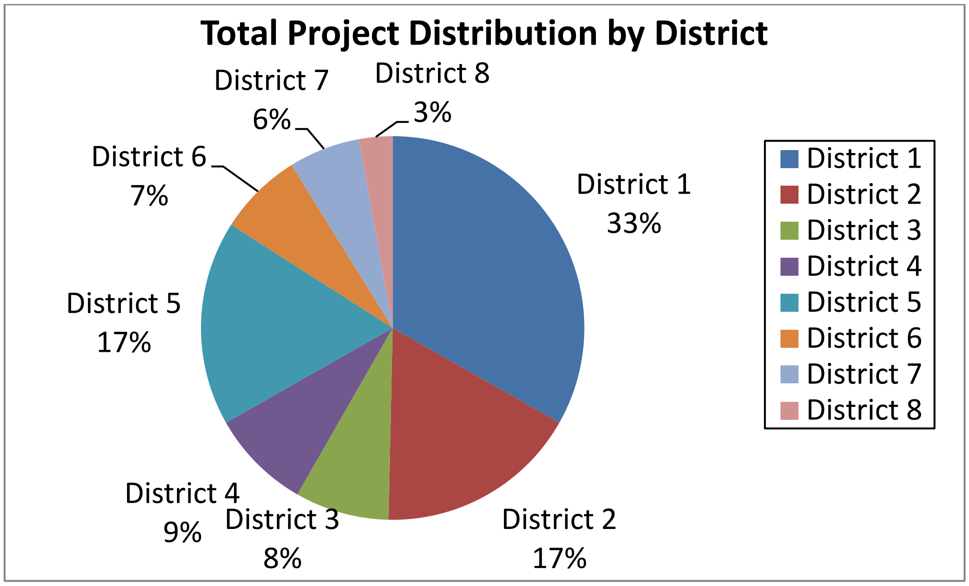

Figure C-2: Total Project Distribution by District

Table C-1, below, shows the initial breakdown of projects based on districts and overall project costs, and Table C-2 shows the breakdown of these projects both by individual district and by the contracting key codes. From the 772 previously selected projects, 633 were identified as having used one of the contracting methods of interest.

Table C-1: Project Breakdown by District and Overall Costs

	Projects Under $1M	Projects Over $1M	Totals Projects
District 1	270	211	**481**
District 2	139	109	**248**
District 3	71	44	**115**
District 4	17	106	**123**
District 5	118	132	**250**
District 6	30	73	**103**
District 7	23	64	**87**
District 8	8	33	**41**
	676	**772**	**1,448**

Table C-2: Project Breakdown by District and Alternative Contracting Method Code

	A3	B0	B1	B2	B2, B5	B5	B8	Totals	
District 1	22	109	2	5	12	13	16	**179**	
District 2	13	65	1			2	16	**97**	
District 3	10	17	1	1	7	1	3	**40**	
District 4	11	21	8			18	12	**70**	
District 5	10	65		3	7	8	19	**112**	
District 6	2	5			7	42	3	**59**	
District 7	3	33	1	3	6	2	7	**55**	
District 8	3	4	1			10	3	**21**	
	74	**319**	**14**	**12**	**39**	**96**	**79**	**633**	**772**
							excluded codes:	**139**	

Table C-3 shows the breakdown of these projects both by individual district and by the categorized project types. From the 633 previously selected projects, 505 were identified as being a project type of interest.

Table C-3: Project Breakdown by District and Categorized Project Type

	T1	T2	T3	T4	T5	T6	T7	Totals	
District 1	17	15	11		105	1	3	**152**	
District 2	4	9	6		54		2	**75**	
District 3	5	4		1	22			**32**	
District 4	9	7	1		27	1		**45**	
District 5	27	9	2		52		2	**92**	
District 6	4	2	3	2	31	7	2	**51**	
District 7	10	2	2	2	28			**44**	
District 8	8		5		1			**14**	
	84	**48**	**30**	**5**	**320**	**9**	**9**	**505**	**633**
							excluded types:	**128**	

From these 505 projects left remaining from Table C-3, specific projects were selected to provide a distribution among the districts, contracting methods, and project types. Also, effort was taken to select a variety of costs ranges. From the previous 505 projects, 190 projects were chosen for investigation. Tables C-4 and C-5 show the breakdown of these projects with regard to contracting method and project type, respectively.

Table C-4: Chosen Project Breakdown by District and Contracting Method

	A3	B0	B1	B2	B2, B5	B5	B8	Totals	
District 1	14	3	2	5	7	6	5	**42**	
District 2	5	11				2	7	**25**	
District 3	4	1	1	1	7	1	2	**17**	
District 4	2	3	8			6	4	**23**	
District 5	5	8		3	6	4	7	**33**	
District 6	1	2			6	11	3	**23**	
District 7	2	3	1	1	6		3	**16**	
District 8	1	4				4	2	**11**	
	34	**35**	**12**	**10**	**32**	**34**	**33**	**190**	**505**
							non-chosen projects:	**315**	

Table C-5: Chosen Project Breakdown by District and Categorized Project Type

	T1	T2	T3	T4	T5	T6	T7	Totals	
District 1	9	9	7		14	1	2	**42**	
District 2	2	7	3		12		1	**25**	
District 3	5	4		1	7			**17**	
District 4	6	5	1		10	1		**23**	
District 5	20	8	1		4			**33**	
District 6	3	2	2	2	8	4	2	**23**	
District 7	6	1	2	2	5			**16**	
District 8	5		5		1			**11**	
	56	**36**	**21**	**5**	**61**	**6**	**5**	**190**	**505**
							non-chosen projects:	**315**	

Figure C-3 shows how resurfacing projects are the most represented type for District 1, comprising a third of the selected jobs. Flexible pavement projects are the least represented, while rigid pavement jobs are not represented at all in this district.

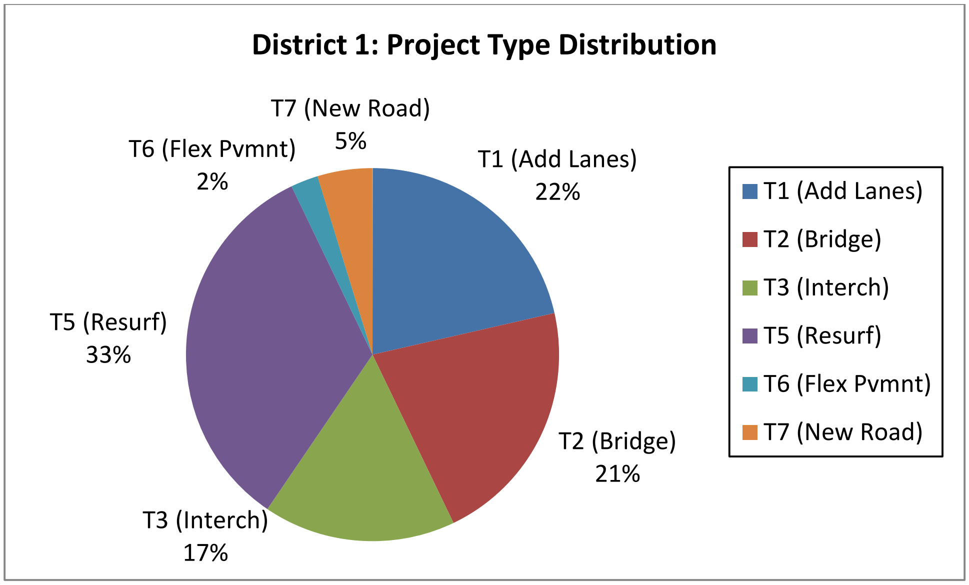

Figure C-3: District 1 Project Type Distribution

Figure C-4 shows, also, how resurfacing projects are the most represented type for District 2, comprising almost half of the selected jobs. New road construction is the least represented, while rigid pavement and flexible pavement are not represented in this district.

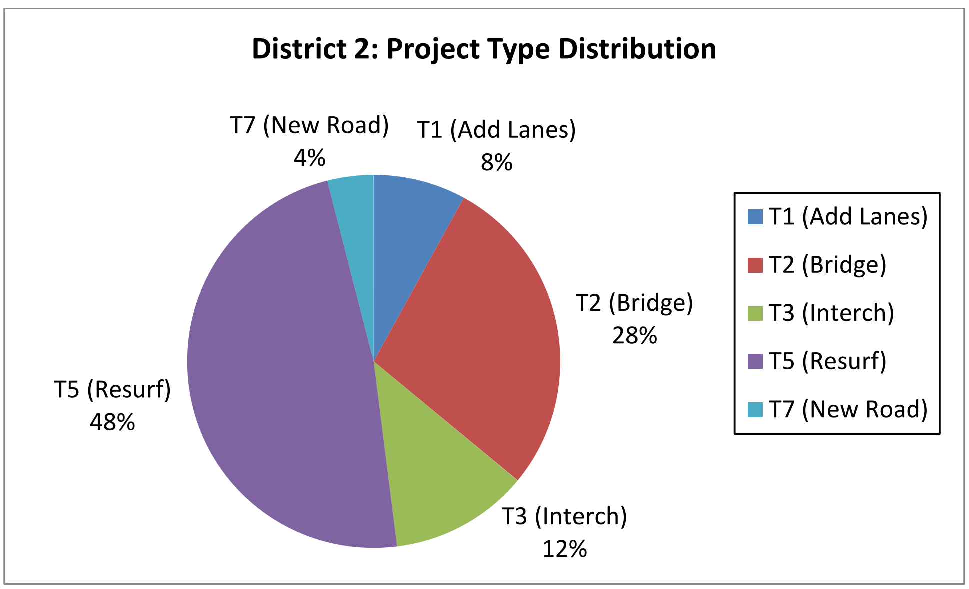

Figure C-4: District 2 Project Type Distribution

Figure C-5 shows, once again, how resurfacing projects are the most represented type for District 3, comprising over 40% of the selected jobs. Rigid pavement is the least represented, while interchange, flexible pavement, and new road construction are not represented in this district.

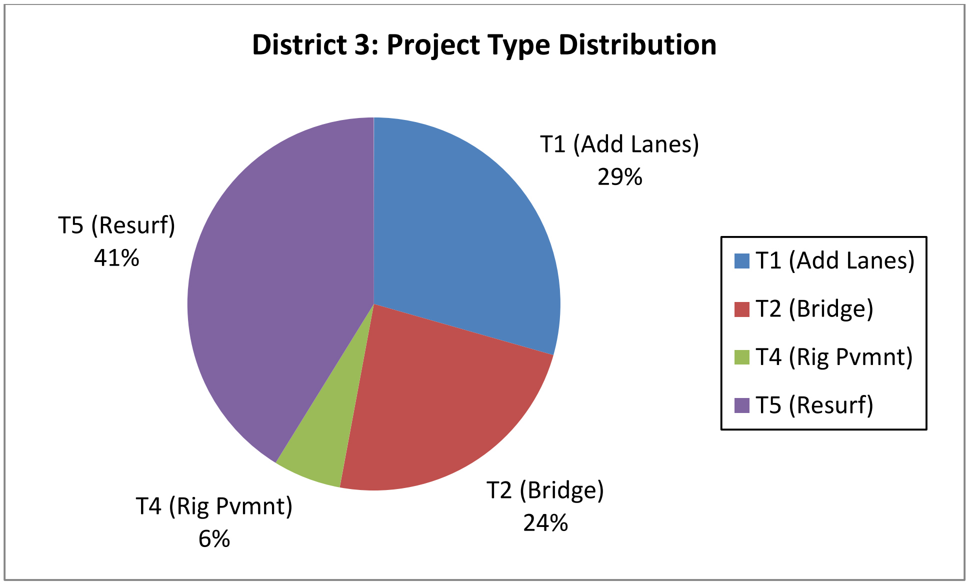

Figure C-5: District 3 Project Type Distribution

Figure C-6 shows resurfacing projects as the most represented type for District 4, comprising over 40% of the selected jobs. Interchange and flexible pavement are the least represented, while rigid pavement and new road construction are not represented in this district.

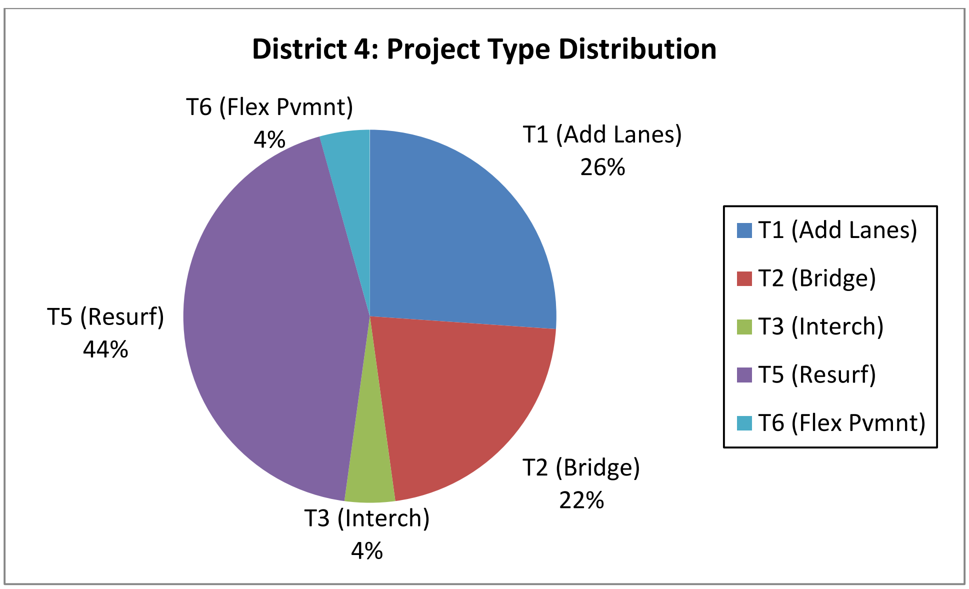

Figure C-6: District 4 Project Type Distribution

Figure C-7 shows how add lane projects are the most represented type for District 5, comprising well over half of the selected jobs. Interchange construction is the least represented, while rigid pavement, flexible pavement, and new road construction are not represented in this district.

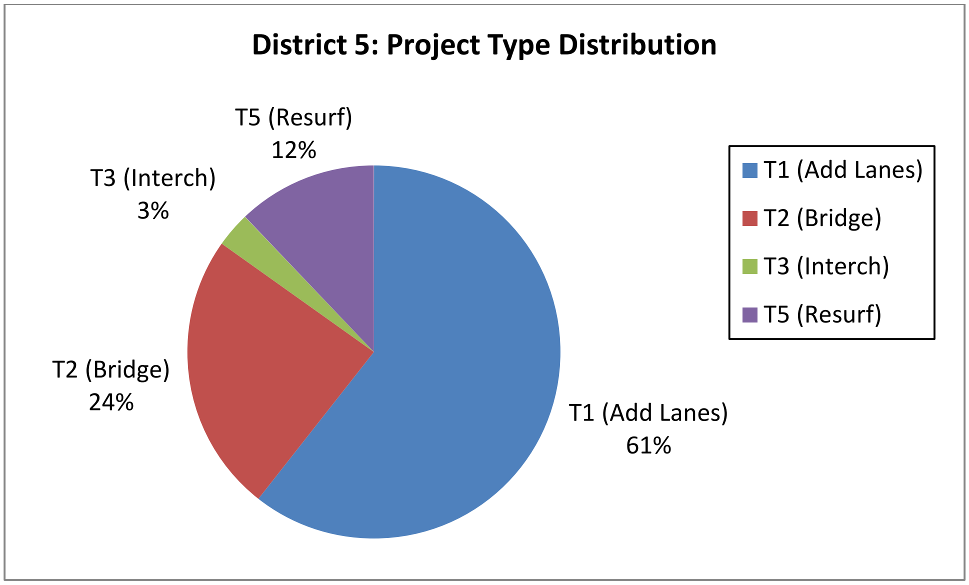

Figure C-7: District 5 Project Type Distribution

Figure C-8 shows how resurfacing projects are the most represented type for District 6, comprising over a third of the selected jobs, while bridge construction is the least represented.

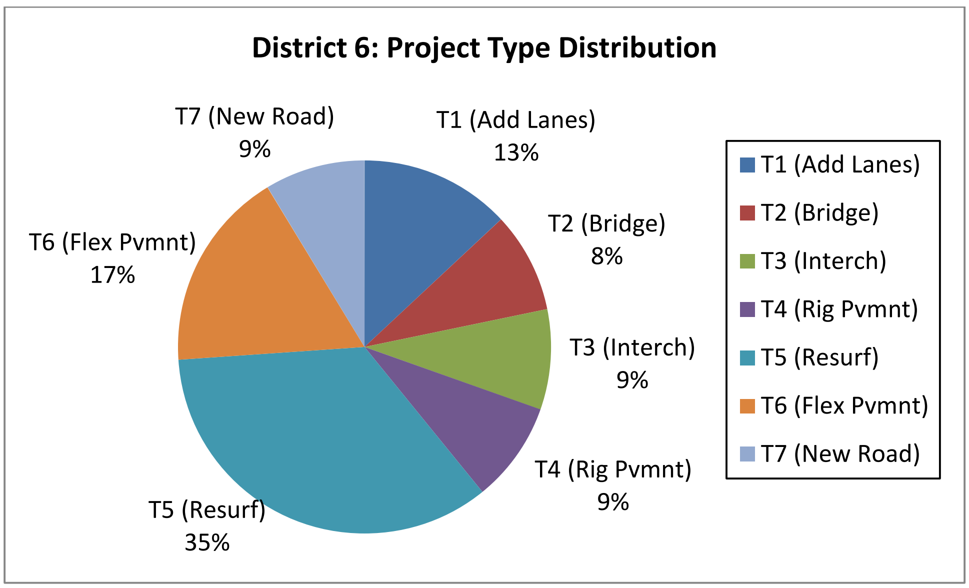

Figure C-8: District 6 Project Type Distribution

Figure C-9 shows how add lane projects are the most represented type for District 7, comprising over a third of the selected jobs. Bridge construction is the least represented, while flexible pavement and new road construction are not represented in this district.

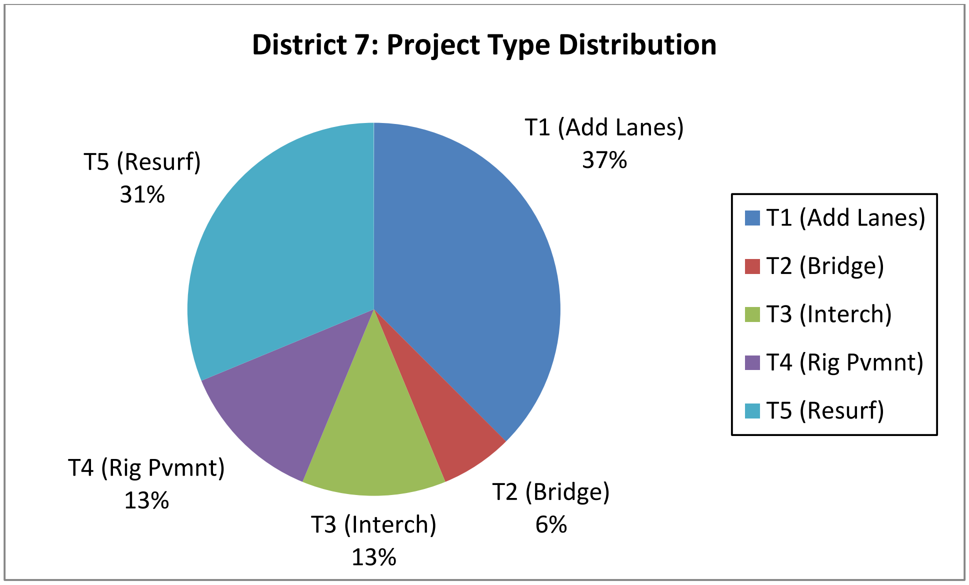

Figure C-9: District 7 Project Type Distribution

Figure C-10 shows how add lanes projects are the most represented type for District 8, comprising almost half of the selected jobs. Resurfacing is the least represented, while bridge construction, rigid pavement, flexible pavement, and new road construction are not represented in this district.

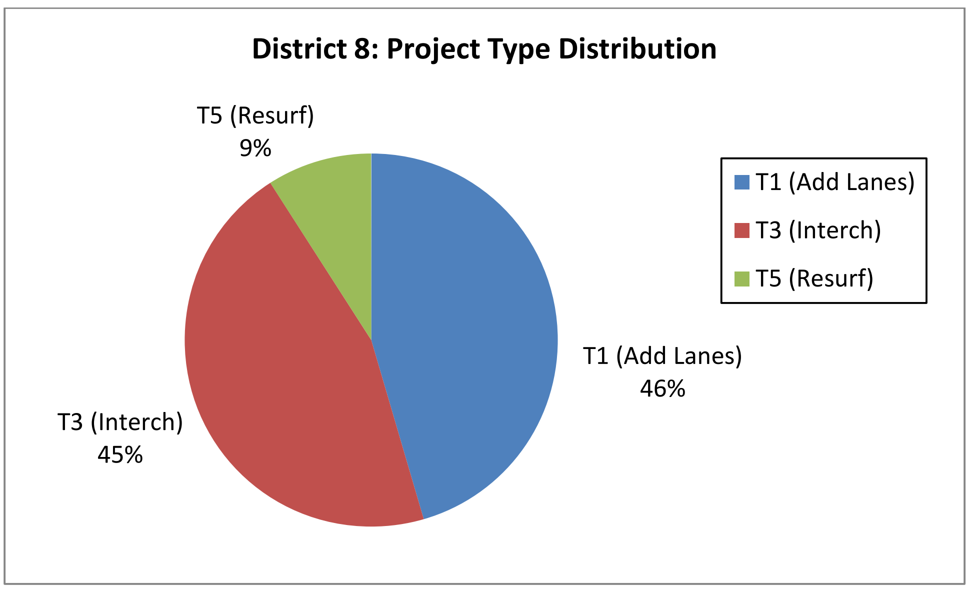

Figure C-10: District 8 Project Type Distribution

Appendix D: Interview Instrument

Appendix D includes the interview instrument as presented to the interview participants. This includes questions derived by the research team to assess the current state of affairs; questions proposed by the FDOT to evaluate the management of alternative contracting projects per the participant's point of view; and general commentary to the refuted literature and conflicting sentiments as established by the survey findings.

FDOT Alternative Contracting Methods Interviews

Participant Information

Date: ____________________ Time: ______________ Interviewer Initials: _________

Individual: ____ Survey User ID: ____________

Agency: ____

FDOT District: _____________

Section 1 of 5: Design-Build

Definition/Preface:
In Design-Build alternative delivery method, both design and construction requirements of a project are combined into a single contract. Many Design-Build contracts are built using the lump sum approach.

1. How much do you agree with the following statement:
   a. *"The procurement process (selection and award of Design-Builder) is transparent and fair"*
      Strongly Disagree Disagree Neutral Agree Strongly Agree

   Comments:

   ____

   ____

2. In your opinion, do you like **DB**?

   ____

   ____

3. What is the best feature of **DB**?

   ____

   ____

4. What is the worst feature of **DB**?

5. Would you consider **DB** a successful contracting method, as currently being used by FDOT?

6. Is Florida using **DB** to its greatest potential?

   If not, how is it being underutilized?

7. What can FDOT do with the implementation of **DB** to improve its use?

8. To benefit from the advantages of **DB**, what does the FDOT need to do?

9. What are your greatest concerns regarding **DB**?

10. When is **DB** a disadvantage?

11. What types of projects do you feel works best with **DB**?

12. Are there other features of a project (besides type) that would lend itself to work best with **DB**?

13. What is the determining factor on when to use a specific contracting method?

14. Do all participating parties (owners/designers/contractors) work well under **DB**?

15. Is there one party that stands out as having the most conflict/difficulty with the method? And how so?

16. Is FDOT District ___ handling **DB** differently than other DOTs/districts/agencies?

    Is their method of handling **DB** better or worse than other DOTs/districts/agencies?

<u>FDOT Task Order Issue Questions</u>:

These questions are specific to the FDOT Central Construction office and their inquiries as to how they are managing alternative contracting projects, per the designers', contractors', and inspectors' point of view.

a. Regarding special provisions that are specific to project contracting methods … are there any specific items in the special provisions that are ambiguous and/or can be improved upon?

b. Did the contracting method have an impact/effect on the QC/QA process? / Did something in the contracting method alter the QC/QA process?

c. Are the contracting methods typically appropriate for the project types? / For projects with bonuses/incentives, are the values set at an appropriate level (i.e., do the values properly reflect daily road-user costs)?

d. Regarding how the FDOT distributes projects by contracting method … are they picking the right projects for their program (i.e., are there enough DB vs. LS projects)? How can they do better?

e. Regarding the use of Adjusted Score vs. Low Bid for Design Build projects … is the FDOT selecting the right method for the right project based on project scope and complexity?

f. Is the RFP clear enough to do your job (e.g., design criteria clear enough for designers)? Is the RFP too restrictive to integrate innovation into the design/construction aspect of the project?

g. Regarding the selection and evaluation criteria for DB projects … is the criteria good enough or fair enough? Do you have any concerns?

h. Regarding stipends for DB non-selected bidders … do compensation values accurately reflect design workload?

Conflicting Issues:

These statements highlight specific issues that are in conflict between designers, contractors, and/or inspectors. If you have any immediate comments regarding these issues, feel free to do so.

- 79% of contractors do not believe unit costs are lower, while 52% of designers and 55% of inspectors believe they are

- 67% of contractors do not believe cost growth is lower, while 75% of designers and 61% of inspectors believe it is

- 69% of contractors do not believe DB reduces owner's/agency's control of design, while 62% of designers and 69% of inspectors believe it does

- 65% of designers and 54% of contractors do not believe contract administration is similar, while 69% of inspectors believe it is

- 71% of designers and 60% of contractors <u>do not</u> believe there is a lower level of contention between the owner and the designer, while 64% of inspectors believe there is

Section 2 of 5: A+B Bidding

17. Does A+B work well as a stand-alone method?

18. In your opinion, do you like **A+B**?

19. What is the best feature of **A+B**?

20. What is the worst feature of **A+B**?

21. Would you consider **A+B** a successful contracting method, as currently being used by FDOT?

22. Is Florida using **A+B** to its greatest potential?

    If not, how is it being underutilized?

23. What can FDOT do with the implementation of **A+B** to improve its use?

24. To benefit from the advantages of **A+B**, what does the FDOT need to do?

25. What are your greatest concerns regarding **A+B**?

26. When is **A+B** a disadvantage?

27. What types of projects do you feel works best with **A+B**?

28. Are there other features of a project (besides type) that would lend itself to work best with **A+B**?

29. What is the determining factor on when to use a specific contracting method?

30. Do all participating parties (owners/designers/contractors) work well under **A+B**?

31. Is there one party that stands out as having the most conflict/difficulty with the method? And how so?

32. Is FDOT District ___ handling **A+B** differently than other DOTs/districts/agencies?

    Is their method of handling **A+B** better or worse than other DOTs/districts/agencies?

<u>FDOT Task Order List of Issues</u>:
These questions are specific to the FDOT Central Construction office and their inquiries as to how they are managing alternative contracting projects, per the designers', contractors', and inspectors' point of view.

a. Regarding special provisions that are specific to project contracting methods … are there any specific items in the special provisions that are ambiguous and/or can be improved upon?

b. Did the contracting method have an impact/effect on the QC/QA process? / Did something in the contracting method alter the QC/QA process?

c. Are the contracting methods typically appropriate for the project types? / For projects with bonuses/incentives, are the values set at an appropriate level (i.e., do the values properly reflect daily road-user costs)?

d. Do you believe the maximum time set by the department during project advertising is reasonable/reasonably aggressive? Could the job reasonably be built within that timeframe?

e. Regarding how the FDOT distributes projects by contracting method … are they picking the right projects for their program (i.e., are there enough DB vs. LS projects)? How can they do better?

Refuted Literature:

These statements are specific to literature found on alternative contracting issues, and were asked in the survey. They highlight main issues that were found in conflict with what designers, contractors, and inspectors felt towards the specific contracting methods. If you have any immediate comments regarding these issues, feel free to do so.

- A+B is best suited for bridge projects

Conflicting Issues:

These statements highlight specific issues that are in conflict between designers, contractors, and/or inspectors. If you have any immediate comments regarding these issues, feel free to do so.

- 64% of designers believe A+B results in significant savings, while 75% of contractors do not
- 79% of designers believe A+B is more influenced by weather, while 52% of inspectors do not
- 63% of designers believe A+B has wide agency support, while 60% of contractors do not

Section 3 of 5: No Excuse Bonus

33. Do you prefer a single large bonus or graduated smaller bonuses?

34. In your opinion, do you like **No Excuse Bonus**?

35. What is the best feature of **No Excuse Bonus**?

36. What is the worst feature of **No Excuse Bonus**?

37. Would you consider **No Excuse Bonus** a successful contracting method, as currently being used by FDOT?

38. Is Florida using **No Excuse Bonus** to its greatest potential?

    If not, how is it being underutilized?

39. What can FDOT do with the implementation of **No Excuse Bonus** to improve its use?

40. To benefit from the advantages of **No Excuse Bonus**, what does the FDOT need to do?

41. What are your greatest concerns regarding **No Excuse Bonus**?

42. When is **No Excuse Bonus** a disadvantage?

43. What types of projects do you feel works best with **No Excuse Bonus**?

44. Are there other features of a project (besides type) that would lend itself to work best with **No Excuse Bonus**?

45. What is the determining factor on when to use a specific contracting method?

46. Do all participating parties (owners/designers/contractors) work well under **No Excuse Bonus**?

47. Is there one party that stands out as having the most conflict/difficulty with the method? And how so?

48. Is FDOT District ___ handling **No Excuse Bonus** differently than other DOTs/districts/agencies?

    Is their method of handling **No Excuse Bonus** better or worse than other DOTs/districts/agencies?

<u>FDOT Task Order List of Issues</u>:

These questions are specific to the FDOT Central Construction office and their inquiries as to how they are managing alternative contracting projects, per the designers', contractors', and inspectors' point of view.

a. Regarding special provisions that are specific to project contracting methods … are there any specific items in the special provisions that are ambiguous and/or can be improved upon?

b. Did the contracting method have an impact/effect on the QC/QA process? / Did something in the contracting method alter the QC/QA process?

____

c. Are the contracting methods typically appropriate for the project types? / For projects with bonuses/incentives, are the values set at an appropriate level (i.e., do the values properly reflect daily road-user costs)?

d. Are the bonuses/incentives worth it (to the contractor) to increase construction efforts to complete the project early/on time? If not, what should the values be?

e. Regarding how the FDOT distributes projects by contracting method … are they picking the right projects for their program (i.e., are there enough DB vs. LS projects)? How can they do better?

Refuted Literature:

These statements are specific to literature found on alternative contracting issues, and were asked in the survey. They highlight main issues that were found in conflict with what designers, contractors, and inspectors felt towards the specific contracting methods. If you have any immediate comments regarding these issues, feel free to do so.

- NEB contractors typically share bonuses with subcontractors to motivate their cooperation

Conflicting Issues:

These statements highlight specific issues that are in conflict between designers, contractors, and/or inspectors. If you have any immediate comments regarding these issues, feel free to do so.

- 91% of inspectors and 75% of designers <u>do not</u> believe contractors typically share bonuses with subcontractors to motivate their cooperation, while 50% of contractors believe they do

Section 4 of 5: Incentive/Disincentive

49. Does **I/D** work well as a stand-alone method?

50. In your opinion, do you like **I/D**?

51. What is the best feature of **I/D**?

52. What is the worst feature of **I/D**?

53. Would you consider **I/D** a successful contracting method, as currently being used by FDOT?

54. Is Florida using **I/D** to its greatest potential?

    If not, how is it being underutilized?

55. What can FDOT do with the implementation of **I/D** to improve its use?

56. To benefit from the advantages of **I/D**, what does the FDOT need to do?

57. What are your greatest concerns regarding **I/D**?

58. When is **I/D** a disadvantage?

59. What types of projects do you feel works best with **I/D**?

60. Are there other features of a project (besides type) that would lend itself to work best with **I/D**?

61. What is the determining factor on when to use a specific contracting method?

62. Do all participating parties (owners/designers/contractors) work well under **I/D**?

63. Is there one party that stands out as having the most conflict/difficulty with the method? And how so?

64. Is FDOT District ___ handling **I/D** differently than other DOTs/districts/agencies?

    Is their method of handling **I/D** better or worse than other DOTs/districts/agencies?

<u>FDOT Task Order List of Issues</u>:

These questions are specific to the FDOT Central Construction office and their inquiries as to how they are managing alternative contracting projects, per the designers', contractors', and inspectors' point of view.

a. Regarding special provisions that are specific to project contracting methods … are there any specific items in the special provisions that are ambiguous and/or can be improved upon?

b. Did the contracting method have an impact/effect on the QC/QA process? / Did something in the contracting method alter the QC/QA process?

c. Are the contracting methods typically appropriate for the project types? / For projects with bonuses/incentives, are the values set at an appropriate level (i.e., do the values properly reflect daily road-user costs)?

d. Are the bonuses/incentives worth it (to the contractor) to increase construction efforts to complete the project early/on time? If not, what should the values be?

e. Regarding how the FDOT distributes projects by contracting method … are they picking the right projects for their program (i.e., are there enough DB vs. LS projects)? How can they do better?

Refuted Literature:

These statements are specific to literature found on alternative contracting issues, and were asked in the survey. They highlight main issues that were found in conflict with what designers, contractors, and inspectors felt towards the specific contracting methods. If you have any immediate comments regarding these issues, feel free to do so.

- I/D often results in utility conflicts

- I/D often results in reduced quality

Conflicting Issues:

These statements highlight specific issues that are in conflict between designers, contractors, and/or inspectors. If you have any immediate comments regarding these issues, feel free to do so.

- 100% of contractors do not believe I/D often results in reduced quality, while 50% of designers and 53% inspectors believe it does

- 69% of inspectors and 57% of designers believe I/D increases need for field inspections, while 62% of contractors believe it <u>does not</u>

- 53% of designers <u>do not</u> believe I/D is best suited for projects where the safety of road users or construction workers is at risk, while 71% of contractors and 79% of inspectors believe it is

Section 5 of 5: Lump Sum

Definition/Preface:
The Lump Sum project requires the Contractor to submit a lump sum price to complete a project as opposed to bidding on individual pay items.

65. Does Lump Sum work well as a stand-alone method?

66. In your opinion, do you like **Lump Sum**?

67. What is the best feature of **Lump Sum**?

68. What is the worst feature of **Lump Sum**?

69. Would you consider **Lump Sum** a successful contracting method, as currently being used by FDOT?

70. Is Florida using **Lump Sum** to its greatest potential?

    If not, how is it being underutilized?

71. What can FDOT do with the implementation of **Lump Sum** to improve its use?

72. To benefit from the advantages of **Lump Sum**, what does the FDOT need to do?

73. What are your greatest concerns regarding **Lump Sum**?

74. When is **Lump Sum** a disadvantage?

75. What types of projects do you feel works best with **Lump Sum**?

76. Are there other features of a project (besides type) that would lend itself to work best with **Lump Sum**?

77. What is the determining factor on when to use a specific contracting method?

78. Do all participating parties (owners/designers/contractors) work well under **Lump Sum**?

79. Is there one party that stands out as having the most conflict/difficulty with the method? And how so?

80. Is FDOT District __ handling **Lump Sum** differently than other DOTs/districts/agencies?

    Is their method of handling **Lump Sum** better or worse than other DOTs/districts/agencies?

<u>FDOT Task Order List of Issues</u>:

These questions are specific to the FDOT Central Construction office and their inquiries as to how they are managing alternative contracting projects, per the designers', contractors', and inspectors' point of view.

a. Regarding special provisions that are specific to project contracting methods … are there any specific items in the special provisions that are ambiguous and/or can be improved upon?

b. Did the contracting method have an impact/effect on the QC/QA process? / Did something in the contracting method alter the QC/QA process?

c. Are the contracting methods typically appropriate for the project types? / For projects with bonuses/incentives, are the values set at an appropriate level (i.e., do the values properly reflect daily road-user costs)?

d. (*Directed toward Designers*) What do you do differently in the design process for a LS project than you do for a traditional/conventional (DBB) project? / (*Directed toward Inspectors*) Does the use of LS permit you more time/effort to focus on other aspects of inspection?

e. Regarding how the FDOT distributes projects by contracting method … are they picking the right projects for their program (i.e., are there enough DB vs. LS projects)? How can they do better?

Appendix E: Interview Participant Responses and Trends

Appendix E includes the interview participant responses, and preliminary analysis of response trends. In the case of participant anonymity, the questions are presented as they were included in the survey, but response data have been excluded.

Design Build

Q1a. How much do you agree with the following statement:

"The procurement process (selection and award of Design-Builder) is transparent and fair"

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

Table E-1: Design Build Transparency Statement Response

	Strongly Disagree	Disagree	Neutral	Agree	*Agree/ Strongly Agree*	Strongly Agree	Totals
Designers	1	0	3	6	*0*	3	**13**
Contractors	1	0	1	4	*1*	0	**7**
Inspectors	0	0	1	6	*2*	5	**14**
Totals	**2**	**0**	**5**	**16**	***3***	**8**	**34**

From the above data, the majority of respondents agree that the procurement process for the Design Builder – as related to the FDOT's current selection process – is transparent and fair. This sentiment is also consistent among the three categories of participants as seen in Figure E-1. Of all the respondents to this question, only one Designer and one Contractor disagreed strongly with the statement. And while not a response category in the original interview instrument, a few participants said their sentiments toward procurement transparency and fairness lay between "Agree" and "Strongly Agree". As such, the "Agree/Strongly Agree" column was included in the table above and represented in the bar graph below.

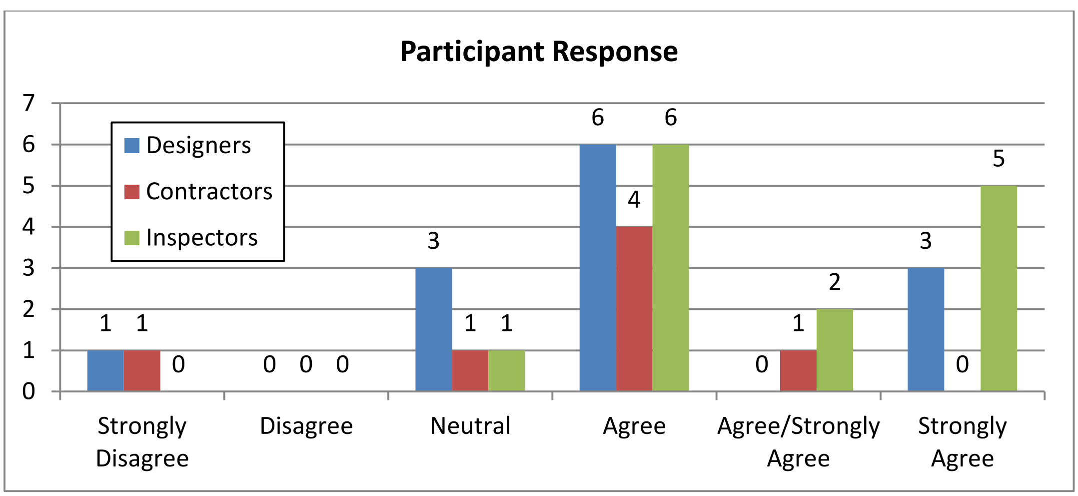

Figure E-1: Participant Response for Question 1a

Q1b. Comments:

Regarding general commentary on the transparency of the Design Builder procurement process, Designers agreed to its transparency, but noted the grading system is subjective in nature. Contractors and Inspectors had no recurring responses of note – although Inspectors did mention not being involved in the process, which seems a reasonable statement as the DB team is comprised of the Designers and Contractors. It is, however, unusual more Inspectors did not mirror this sentiment – as it would be expected their responses be "neutral".

Table E-2: Responses to DB Transparency

Designer Responses	**Times Noted**
In general, yes	1
Strongly agree with it	1
Everything looks pretty clear	1
Not that it's not transparent – but the procurement process lasts months	1
Fairness is tough to assess (TRC members don't know what they're doing) – overall, they're not where they need to be	1
Construction agency is seeing its use / structure is not there / DB-er does not report to Contractor	1
Transparent is subjective / there is a grading system, but as long as people are involved it's hard to take out the subjectivity	2
Contractor Responses	
DOT does a good job of running the process … have not, in all my years, found a leak of info, or seen that the process is compromised	1
Don't know about transparent, but it is fair / transparent after the fact (in the sense that the final bid/award information is released to the public in the end)	1
Inspector Responses	
Process is transparent	2
FDOT tries very hard to be transparent, but find themselves in situations where the DB process is protested / it's not a problem with their system but they try to go over the top in transparency and delay the procurement process	1
Don't strongly agree with the statement … I've seen where ATCs are submitted, and then the RFP is redrawn to have all the other agencies resubmit with their own ATC	1
Upfront submittals for DB allows the FDOT to make selections with more information up front	1
Main aspect of procurement for the FDOT is the amount of residuals they look at … it transcends all other technical aspects / they see a specific firm/team with a lot of experience and they shift focus to them	1
Can't tell – I am not involved	1
Do not have sufficient knowledge to comment on the process	1

Q2. In your opinion, do you like DB?

General consensus regarding DB is that Designers, Contractors, and Inspectors alike are fond of the method. Designers had no other statements of note, but did comment on there being too much risk on themselves (and project engineers), as well as having to split their loyalty between owner and contractor. Contractors and Inspectors had no recurring responses of note, but Inspectors did mention DB requires high quality project management.

Table E-3: Responses to Liking DB

Designer Responses	Times Noted
Yes	8
No	2
Used with smaller cities (better for smaller contracts) / contractor not involved as much / smaller works well / structures, more complex projects = wrong direction	1
Strongly agree with it	1
Places too much risk on Designer/Engineer *(I think that's why it's so popular)*	1
When properly used, it's a very good method	1
Would prefer DB if that was the only method the DOT used as procurement	1
Contractor Responses	
Yes	5
No	2
FDOT adds other cost items to the contract and the DB firm can't refuse doing the additional work	1
Inspector Responses	
Yes	14
No	1
Contractor knows how he wants to approach the job because he helped design it	1
Generates a much higher need for high quality Project Management during the project. *(Paperwork and submittals are increased for the PM team.)*	1
It is right for the right kind of project	1

Q3. What is the best feature of DB?

Designers, Contractors, and Inspectors all repeatedly note time savings as among the best feature for DB projects. Designers also mention innovation and creativity as important elements, along with the collaboration between designers and contractors, specifically. Contractors also made notable mention of the contractor's collaboration, input, and decision making ability. Inspectors also noted the increased ability of DB to promote competition and provide innovative design. Inspectors, however, also made several references to the reduction of risk and liability on the part of the owner/department.

Table E-4: Responses to DB Best Feature

Designer Responses	Times Noted
Time savings	2
Accelerates delivery – in getting construction started quickly (not necessarily completed)	1
Streamlines time – providing greatest benefit to the public *(almost half the time versus DBB with design, letting/award, and construction)*	1
Creativity and speed – DOT has realized they can do projects a lot quicker with DB	2
Allows innovation to work into the process – not only with design, but with how things are built	1
Aligns builder and designer, getting project successfully delivered -- Designer and Contractor have a common goal to deliver it as easily as possible	1
Provide the possibility for the contractor and designer to work together – that always produces good results	1
Cost savings	1
Shifting of risk from the owner's prospective, because it equates to a lot of money.	1
Contract negotiation / Profit margins are larger in DB (that's the big thing)	1
DOT doesn't care how much "pain" goes into delivery	1
DOT is too bureaucratic – they need to do less	1
None for consultants	1
Contractor Responses	

Gets jobs going faster / faster delivery / speed	4
Contractor input to decision / More input with respect to constructability / collaboration	7
Earlier involvement	1
You can make use of innovation	2
Lump sum nature of the contract	1
Not DBB	1
Inspector Responses	
Design and review process is much quicker	1
Saves time / Solves the problems faster / quick response *(eliminates back and forth on design, contract RFI, less administration, "goes to street quickly")*	3
Quick response to RFIs *(i.e., not as many people in the chain)*	1
Fast delivery	2
Contractors and Engineers can collaborate and give you the best product for your money. Speeds up the process.	1
Contractor and designer to work out optimum design for that specific team	1
Allows for innovation / promotes competition via innovation	3
Gives contractor the opportunity to become creative (within certain parameters) / contractor can work to his strength – be innovative	2
Contract management is much easier	1
Contractor takes full responsibility for design	2
Liability … taking it off the department's hands	1
Designer having more responsibility and communicating with the contractor that works hand in hand with them	2
Reduction of owner/department design risk	2
Claim reduction / reduced number of claim orders	3
The DB concept: hiring a design firm to design and build it; picking the best suited team with experience that has worked together and can be innovative	2
Since it has a lump sum contract measuring pay items is not required	1
Inspection staff placed focus more on quality rather than tracking quantity for payment	1

Q4. What is the worst feature of DB?

Designers felt there is a lack of understanding and education in the early stages of preparing and interpreting project specs, codes, and RFPs. Designers and Inspectors both mention issues with lower product quality and inferior design for DB jobs – both being inferior to the traditional DBB method, and often the result of having to yield to speed of construction. Contractors noted inequitable risk, especially with having to deal with unknowns. Designers and Contractors both bring up issues with the award process, observing its subjective nature in grading (specifically how the TRC individuals have other responsibilities and cannot fully read proposals), and the tendency for low-bid jobs (and not the best valued project) to win. Contractors and Inspectors highlight the FDOT's unwillingness to let go of control/power (also seen in the highly prescriptive nature of their DB proposals). And Inspectors touch on unclear RFPs resulting in only obtaining minimum design requirements.

Table E-5: Responses to DB Worst Feature

Designer Responses	Times Noted
All parties do not equally understand the RFP elements	2
Interpretation in what the code/specifications say costs time and money	1
Lack of understanding/education of the participants on each one's involvement *(e.g., contractor looks on designer as a subcontractor rather than a team member)*	1
Manipulation of design by the contractor – they sacrifice production to save money	1

Risk with upfront costs *(i.e., DOT doesn't understand – stipends are still too low based on saving they're getting)*	1
Excessive risk on groups that make the least amount of profit / Bypasses reviews / Shortcuts on design and construction	1
Bureaucracy involved in the design phase	1
Project management wise, more paperwork involved *(e.g., the perpetual cycle of plans, reviews, comments, and final plans)*	1
FDOT sometimes get slightly inferior design	1
Final product quality sometimes inferior to traditional DBB method	1
Lowest bidder still wins the project – not always team providing best value (department doesn't have the ability to select on best value)	1
Working for contractors	1
Owner's representative (which is an engineer) questions everything *(i.e., they oversee and constantly question design – and this costs more money)*	1
Contractor Responses	
Jobs are too big – should be broken up to give more bidders a chance	1
Risk transfer not always equitable / contractor assuming all the risk, especially with issues we cannot control *(i.e., geotech. issues)*	2
Utilities – DB firm has no contractual relation with utility firms / Too many variables beyond the contract items	1
Tendency to be too prescriptive and restrictive	1
FDOT will not let go of their power	1
Procurement is draining and unpredictable	1
Subjectivity in award process	1
TRC is manned by people with other responsibilities *(i.e., money and time spent on proposals, yet TRC members do not, and cannot, fully read the proposals)*	1
When the combination of low score and low bid wins	1
Inspector Responses	
DB firm provides minimum design requirements / selection of better quality design/materials requires change order / if not in the RFP, contractor will not deliver it	6
Quality tends to lose to speed – depending on the contractor	2
Contractor makes a mistake, Designer can re-design / Designer makes a mistake, Contractor can compensate for it	2
Tendency to become "build then design" during construction / contractors prone to build an as-built rather than Design Build	2
Problems with letting go of control *(i.e., with standard DBB, we have control of design – with DB, we have to let go a bit)*	1
Impact on design consulting firms	1
Pricing and time pressure on designer	1
Enforcement and loopholes	2

Q5. Would you consider DB a successful contracting method, as currently being used by FDOT?

The majority of Designers, Contractors, and Inspectors all feel that as, currently used by the FDOT, DB can be considered a successful contracting method.

Table E-6: Responses to DB Success

Designer Responses	Times Noted
Yes	10
Some negatives – in a lot of projects, they go better being pre-designed (or 75%)	1

Appears successful to the FDOT *(it is not good for many in the consulting industry)*	1
Florida is a model for other states – they can push projects through their system a lot quicker	1
DBB better represents the owner	1
To improve DB, put more emphasis on points on how you're scored in relation to the cost – because right now it's a low-bid effort	1
Contractor Responses	
Yes	6
Successful in getting the work going faster	1
No – construction side of the industry is not satisfied with it	1
No – less interest from contractors in DB when the number of DB jobs is growing	1
Sometimes it works, sometimes it doesn't	1
With DB they make it a price race in how they evaluate proposals	1
Inspector Responses	
Yes	14
Successful for larger, complex projects	1
No	2
Shouldn't be a go-to on every project of a certain size	1

Q6a. Is Florida using DB to its greatest potential?

The majority of Designers, Contractors, and Inspectors all feel that Florida is using DB to its fullest potential. (However, it should be noted, this sentiment is not unanimous among Designers and Inspectors – with about as many of them believing it is not used to its fullest potential.) Designers also note it is almost over-utilized, while at the same time being too prescriptive and the DOT needing more trust. Contractors also expressed the over-utilizing of DB. Inspectors, however, mention it should be used more often (counter to the Designers' and Contractors' views), and they also suggest eliminating minimum options.

Table E-7: Responses to DB Potential

Designer Responses	Times Noted
Yes	6
No	4
About half the jobs are good candidates for it	1
DOT needs more trust	1
May be used more than it should / almost over-utilizing it	3
More in some districts than others – but all can get more active	1
End result is not the best value	1
When team selected before price is ever negotiating – takes the owner outside of the ability to contribute to the process *(i.e., they sit back reviewing/approving vs. being part of the solution)*	1
Too prescriptive	1
Do not know	1
Contractor Responses	
Yes	5
No	1
Doing too much of it *(e.g., during the stimulus, they were in a hurry to get projects on the street and they started doing too much, realized how easy it was to get work out, and over did it)*	1
DB works for mega projects	1
Because they do a lot of DB work … they have different types, and if they can fix/loosen prescription and make it a more equitable risk transfer	1
Inspector Responses	

Yes	8
No	5
Large projects are where it needs to be used and that's where FDOT uses it	1
Probably	1
Take away the minimum option	2
Could be used more often	3
Spread of projects between different delivery systems	2
Don’t know	1
Do not have enough information to provide an opinion	1

Q6b. If not, how is it being underutilized?

Thoughts on how DB is being underutilized include the Designers’ suggestion to become more flexible and permit more innovation (as DB currently appears too much like DBB). Contractors and Inspectors simply suggested it being used more frequently and on more projects.

Table E-8: Responses to DB Underutilization

Designer Responses	**Times Noted**
Organization of DB – if differently (side by side, keep time savings and not sacrifice production)	1
Not sure – selection process is unclear	1
Maybe over-utilized *(DOT is recognizing that -- they're pulling back)*	1
Need more flexibility and innovation – too much like DBB as is	1
Only advantage with DB is they can procure the project faster *(that overrides innovation)*	1
Contractor Responses	
If used more frequently, people would be more satisfied with it	1
Don’t think it’s being underutilized	1
Inspector Responses	
Should be used on more projects -- could speed up projects to be let	1
Don’t have many DB projects on the market	1
To improve use, have teams provide proposal to the budget	1

Q7. What can FDOT do with the implementation of DB to improve its use?

To improve its use, Designers suggested being less restrictive/prescriptive, have a more hands-off approach, being open to innovation, selecting better projects, and also increasing its use with smaller- and medium-sized projects to allow more firms to gain experience with the method. Contractors also suggested being less prescriptive, using it on smaller projects, and increasing its use to promote familiarity with firms. Contractors also proposed several tweaks to the selection process including improving the technical review process, selecting firms based on adjusted score (and not low bid), and increase the number of firms awarded stipends. Inspectors also proposed using it on smaller jobs, discontinue selection based on low bid, and generally improving RFP development (including the need for innovation and the conflict with being overly prescriptive).

Table E-9: Responses to DB Implementation

Designer Responses	**Times Noted**
Be less restrictive / be less prescriptive	2
Be more willing to accept a hands-off approach if they want to see cost reduction	1
Be more open to innovation – they want ATCs, but don't go for it	1
Comes down to low-bid -- so why go to DB besides just getting federal dollars	1

Larger projects with few utilities, fewer permits required -- are perfect for DB	1
Large resurfacing projects would be good for low-bid DB	1
Continue to tweak the RFP process	1
Organization of DB – if differently (side by side, keep time savings and not sacrifice production)	1
Increase the potential profits to increase more participation and then push the price down	1
Increase the use of DB – promote smaller/medium sized firms and contractors to have a go *(e.g., consider putting out smaller projects/packages that are, perhaps already designed, or have all the info already gathered)*	1
It's limited to the bigger projects, not the side walk projects	1
Owner has to be part of the concept process – collaborate with DB firm more / have owner go through the ATC process – tell designer, upfront what they do and don't want	1
Not become the only delivery method	1
Pick projects better – they don't always follow guidelines	2
Contractor Responses	
Make it less prescriptive – try end-result specs	1
Make the projects smaller	1
Increase its use	1
Pick the right projects	1
Improve the technical review process	1
Select DB firms based on the adjusted score method not low bid / Get rid of price race	2
Increase stipends to promote competition – increase number of non-winning firms paid up to 3	1
Return to a true shortlist with stipends for all	1
Inspector Responses	
Use DB on smaller types of projects (e.g., bridges under 200 feet, bridge projects less $2 million)	2
Strengthen the RFP language	2
Increase training of DOT employees putting out DB project submission packages – RFPs are missing items	1
Eliminating DB firms based on their technical score, as they used to do	1
Do not do low-bid DB	1
System works well right now	1
Conflict between prescriptive RFPs and wanting to allow innovation for contractors or engineers	1
Improve development of RFP requirements	1
Identify minimum requirements.	1
Spend more time to avoid minimums without limiting innovation	1
Clear quality assurance rules	1
Identify available money and general projects and ask community to provide proposal for what they think they can provide	1

Q8. To benefit from the advantages of DB, what does the FDOT need to do?

To benefit from the advantages of DB, Designers suggest improving the selection of DB projects (choosing projects that would benefit from the delivery method); as well as being more open to creative ideas and incorporating innovation from engineers and contractors. Contractors suggest making it less prescriptive, increasing its use and allowing more innovation. Inspectors also suggest choosing the right projects for DB to begin with. They also discuss improving development of the RFP requirements, providing correct information, and even suggesting a review of the RFPs with potential bidders to put everyone on the same page.

Table E-10: Responses to DB Advantage Benefits

Designer Responses	Times Noted
Improve selection of DB projects – choose projects that would benefit from DB)	2
Be less overbearing	1
Be more open to creative ideas *(i.e., innovation)*	1
Be willing to incorporate more innovation from engineers and contractors	1
Lack of education … categorize the kinds/types of projects that should be built using DB	1
Remove cap on the amount of money spent on DB projects	1
Do smaller DB projects	1
Make RFP more fair	1
Lack of education … make everyone aware of the shared responsibility on the final product (i.e., contractor treats designer as subcontractor)	1
For bigger projects, provide additional review time for project management personnel	1
Specifications and standard details need clarification	1
Provide consideration to teams that have not done DB	1
Contractor Responses	
Make it less prescriptive – try end-result specs	1
Get rid of price race	1
Increase use of DB	1
Allow DB firm talk to user group (specially on bridge projects)	1
Allow more innovation	1
Inspector Responses	
Choose the right project for the delivery system / Limit its use to projects that work well under a DB letting	3
Provide correct info in RFP / Improve the development of the RFP requirements	2
Perform "page-turn" reviews of RFP with all potential bidders (such as is done with Technical Proposal) … after the RFP, and about 30 days before Technical Proposals are due	1
Increase competition if the design part of the contract was negotiated separately	1
Stipend for partial delivery	1
Identify the minimum requirements	1
Spend more time to avoid minimums without limiting innovation	1
Reduce scope creep	1
Minimize outside agencies changing what goes into the plan after the procurement period	1
Obtain more input from design firms	1
Create an “internal mentality” with FDOT/Consultants that DB projects are not only the Contractor’s issue because the final products go back to FDOT	1
Allow more flexibility in design rather than keep them fixed on the standards	1

Q9. What are your greatest concerns regarding DB?

Designers’ addressed concerns with the following: the individuals scoring proposals (that they must fully understand contract requirements); product quality manipulation and loopholes; contractors keeping costs to a minimum (preventing engineers from introducing safety factors for uncertainties, and making adjustments for the sake of their profit margin); and the necessity for building relationships and partnerships. Contractors emphasized increasing the number of DB projects to increase their opportunity to work (stressing how, with current practice, the same contractors win most of the jobs). Alternatively, contractors voice concerns with the TRC process, and claim the shortlisting process is not competitive enough (lists are far too long). Inspectors had issue with minimum design – how improving product quality requires change orders. This matter is directly linked to another one of the inspectors’ concern with unclear and non-detailed RFPs – which directly lead to designers and contractors only providing the minimum requirements. Thirdly, Inspectors remark on the taxing nature of ATCs, and the inadequate compensation (i.e., stipends) for design work.

Table E-11: Responses to DB Concerns

Designer Responses	**Times Noted**
Those scoring proposals need to completely understand the contractual requirements	2
Manipulation of quality of product	1
Quality loop holes	1
Contractor moves profit margin	1
Contractors try to keep costs to a minimum, not allowing the engineer to introduce safety factors to allow for uncertainties	1
Cost to procure too high for designers … improve stipends	1
Refine procurement process	1
DB selection process used just to grab the most (federal) money	1
There is a lot of risk	1
Would be less stressful if FDOT wasn't so anti-SA (Supplemental Agreement)	1
Contractor should be compensated when there are changed conditions	1
Project scope should be clear and well-defined	1
A lot of relationship building required	1
Lack of partnership – designers are tied to contractor, but treated as a subcontractor, not a partner *(i.e., designers have owners as the client, but answer to the contractor)*	1
Owner's representative (the same consultant developed RFP) should be involved early on	1
It is underutilized	1
It shouldn't be used on small, simple projects	1
Contractor Responses	
Increase DB projects to increase contractor opportunity to do work	1
When one Contractor gets all the work, and is having problems doing all the work	1
Dealing with utilities – FDOT (who is willing to grant time, but not money) pushes the responsibility onto the contractor	1
Shortlisting process – lists are too long from FDOT trying to not unfairly exclude firms (which is counterproductive to competition)	1
Scoring TRC only	1
FDOT changes the scope after award	1
Changes in the CSIs (cost savings initiatives)	1
Regarding CSIs, they hold it against you if you don't go into great detail … but also if you provide too much detail	1
Schedules can be too short	1
Inspector Responses	
Minimum design	2
DB firm provides minimum design requirements and selection of better quality design/materials need change orders	1
RFP not being clear descriptions or specifying the DOT's exact requirements – resulting in only getting the minimums	2
Writing the RFP appropriately	1
Detail level in the plans (e.g., DP and Contractor put minimum amount of info, leading to RFIs)	1
Extensive ATC process on large DB jobs is taxing on the firms – a huge resource commitment	2
Risk engineering firms take on when bidding – inadequate compensation (stipend) to cover design work	1
Frequent interference from outside (i.e., the Central Office)	1
Risk involved doing work without completed plans	1

Contractor adding advantage or relationship with Designer -- forces Designer to do things that wouldn't normally happen (more cost driven)	1
Getting something we are prepared for	1
DOT must provide products to public … but are the only organization willing to do research	1
Large projects should not all be DB	1
Quality Assurance	1
EOR inclined to offer solutions to suit only the contractor rather than what is best for the project	1

Q10. When is DB a disadvantage?

Designers feel DB is a disadvantage with larger, more complex jobs; when the department is uncertain with what they want; and when a job is heavy with utilities, right-of-ways (ROWs), and other unknowns beyond the DB firm's power. Contractors say DB is a disadvantage when utilities are involved; when job scope and RFPs are unclear; and when too many teams/bidders, making it costly for the engineers to pursue. Inspectors cited DB is a disadvantage when used with smaller jobs; when jobs are inherently non-DB (and better suited as DBB – such as those requiring no innovation and permitting little design flexibility); and when jobs have issues with scope, proposal information, revisions, and several unknowns.

Table E-12: Responses to DB Disadvantage

Designer Responses	**Times Noted**
Bigger, more complex jobs / overly complicated jobs (where constraints are only defined after being awarded the job)	4
When department doesn't know what they want	3
With complex utility issues / With heavy utilities and ROW jobs / A lot of unknowns	5
Budget may force FDOT to use DB	1
For small projects	1
Demanding preparation of proposals – reducing pool of teams deciding to participate, leading to same teams being selected	1
When losing a DB job – and not awarded a stipend – therefore, must be selective with what you choose	1
Contractor Responses	
With complex utility involvement / heavy utility jobs	2
When FDOT does a bad job assembling scope / When RFPs are not real clear	2
When too many teams are allowed to participate in Phase 2 / When too many bidders – makes it costly for engineers to pursue	2
When risk not equitably shared (i.e., responsible for hazardous, and unforeseen)	1
When there is a bust in quantities	1
When there is no room for innovation	1
With small projects -- because you limit competition	1
Inspector Responses	
With smaller projects / with smaller jobs, DB can make the process too complex to be worth it	8
With projects that do not require innovation / With jobs that would be best suited with traditional bidding / When you pick the wrong project / When little flexibility allowed in design *(i.e., owner already has a defined and fixed goal)*	6
Jobs with a lot of variability and a lot of political influence that would probably change the scope of the projects	2
When there is a problem and owner has to review/accept plans revisions	1
A lot of potential unknowns	1
With lack of information on DB proposal	1

When scope of work is not clear	1
When it is not cost effective	2
When you pick a project with a lot of utility relocations, a lot of other critical factors, where it would be local involvements and commitments.	1
When you have specific controls (i.e., alignment, milestones) combined with short timeframe	1
With typical roadway conditions	1

Q11. What types of projects do you feel works best with DB?

Designers think the types of projects that work best with DB include smaller, simpler projects; jobs with no, or minimal, ROW/utilities (or in the case where there are ROW/utilities, that the department helps in the process); and when innovation and value engineering are desired. Contractors and Inspectors both think the best jobs for DB would be complex jobs (including interchanges) and bridges.

Table E-13: Responses to DB Best Type Projects

Designer Responses	Times Noted
Smaller, simpler, quicker turnaround	4
Design having minimum utility, without ROW / Jobs without ROW or permitting / With complex utilities – when department helps in the process	3
When innovation desired (e.g., ATC process, value engineering)	3
Capacity improvement projects (e.g., widen bridge / interchange)	1
Large projects with few, or no unknowns, that stay within existing ROW	1
Large projects that have major impact to the public	1
Really complicated projects	1
Projects that require uncommon means and methods, innovation, duplication of plans	1
Middle complexity project	1
New road ways	1
Additions	1
Major interchange, interstate projects	2
Anything that does not have a lot of constraints	1
Contractor Responses	
More complex jobs / Complex interchanges / major urban interchange	4
Bridges (large)	3
When innovation desired	1
Widening on long projects	1
ITS / Big signalization job	1
Milling/resurfacing	1
All types can work	1
Large movable bridge projects are the most difficult – may be best with CM at risk than DB	1
Inspector Responses	
Bridges (both, significant and minor)	6
Large, complex projects / large overpass (or intersection) work on major highways	5
Interchange / interchange improvements	4
Widening project with no utilities	3
Interstate projects	2
Projects with clear and understandable scope of work	2
Smaller projects	2
Greenfield	2
New construction	2
Drainage improvements	2

Reconstruction jobs on high urban areas	2
Medium and low risk projects	2
Large specialized projects	2
Any type can work	2
Non-standard design jobs	1
Projects in rural areas	1
Time-sensitive projects	1
Corridors	1
Redundant projects (i.e., resurfacing)	1
Where the existing conditions are a challenge	1
Project with major utility coordination	1

Q12. Are there other features of a project (besides type) that would lend itself to work best with DB?

Designers felt the following features best lend themselves to DB: project simplicity/complexity and unknowns (in addition to time-sensitivity and the requirement of special means and methods). Contractors felt the following features best lend themselves to DB: complexity; utility/ROW usage; and budget. Inspectors felt the following features best lend themselves to DB: time-sensitivity; budget; and complexity.

Table E-14: Responses to DB Working Best with Specific Features

Designer Responses	Times Noted
Simple projects / less complex projects / Complexity	3
Number of unknowns	3
Resurfacing	1
Widening	1
Reconstruction	1
Architectural projects	1
Time-sensitive	1
Special means and methods	1
Lack of constraints / limited potential for unknown conflict	1
Contractor Responses	
Complex projects	2
No or low utilities / Any required ROW	2
Budget	1
Not large complex movables	1
Inspector Responses	
Time-sensitive / faster delivery time	5
Funding / When existing funds have to be spent quickly	3
Complex projects	2
Longer project	1
Rail job	1
Milestone projects	1
Community-impacting projects	1
Jobs greater than 17 million dollars	1
When existing conditions are a challenge	1
High risk jobs (financial or technical)	1

Q13. What is the determining factor on when to use a specific contracting method?

Designers said the determining factors on when to use a method are: permitting, ROW, utilities, and environmental issues; schedule concerns; project complexity; and funding. For Contractors, timeframe was the determining factor. For Inspectors, as with Designers, the determining factors were complexity, funding, and schedule concerns.

Table E-15: Responses to DB Determining Factors

Designer Responses	Times Noted
ROW / if department doesn't own ROW or can't procure it in a timely manner / Utility impacts / Permitting / Environmental issues / PD&E (specifically if the DOT does it)	7
Time / schedule	4
Complexity	2
Type of funds (i.e., state or federal funding)	2
Traffic demands	1
High demand, large jobs	1
When there's a great public benefit	1
Value	1
How dated are concepts	1
Flexibility	1
Client makes that decision	1
Innovation	2
Contractor Responses	
Timeframe / speed / Anything that will shorten the project and get the road cleared faster is good	4
Type of project	1
Opportunity for innovation	1
Percent of project definition	1
Public need	1
FDOT makes that decision	1
Inspector Responses	
Complexity	5
Cost / when funds need to be spent	5
Time constraint	4
Location	2
Commitment	2
Amount of preliminary studies/permitting needed / Potential issues / Where existing conditions are a challenge	2
Impact on the public	1
Contractor turn-over	1
Type of project	1
Liability	1

Q14. Do all participating parties (owners/designers/contractors) work well under DB?

Regarding teamwork between participating parties, Designer and Contractor responses did not reflect strong majorities. Designers narrowly said "no", they do not all work well together, while Contractors narrowly said "yes", they do work well together. Inspectors were more distinctive, with the majority saying "yes", they work well together. (Notable issues for all are the conflict between Designers and Contractors, as well as the Designer's obligations to both Owner and Contractor.)

Table E-16: Responses to DB Party Cooperation

Designer Responses	Times Noted
Yes	3
No	4
Sometimes / May or may not … depends on different things	3
May be some issues with contractor and designer	1
CEI struggles -- want to run job like traditional	1
Each company has its own merits	1
Some contractors do, others have poor teamwork	1
Some owners don't want to give up total control	1
Districts have improved	1
Owners (FDOT districts) are not consistent	1
Designers make more money on DBB jobs, so some designers are anti-DB	1
Lack of education – department should invest in educating the industry: ensure all participants do not get lost on the traditional way of thinking	1
Disconnect between contractor and engineering firm knowing the amount of work that's required	1
May or may not … depends on different things *(i.e., if jobs are going well)*	2
Owner's representative (CEI / RFP engineer) tries to manage it as DBB – we try to manage it as DB	1
Contractor Responses	
Yes	3
No	2
It is a team effort	1
Contractor and Engineer work better on DB than on DBB	1
Design reviewers are stricter on design-build designs than conventional designs	1
Depends on complexity of the job, how much info is known or not known, if PD&E has been done	1
Inspector Responses	
Yes	7
No	3
Depends on the DB firm selected / Depends on the parties involved	4
Only if everybody is open to innovation	1
There are individuals in all these that tend to muck it up	1
There are always frictions/unforeseen – someone has to be the bad guy and say no	2
Always conflict between contractors and designers *(e.g., contractors put designers in a hard position because contractors always want to cut corners and take a short cut)*	2
Owners see DB as giving all risk to DB team	1
Designers torn between owner and contractor (caught in middle -- contractors abuse that)	1
CEI component is more complex and require a team that can manage this type of contract well. *(i.e., tracking of larger number of submittals, plan revisions, etc.)*	1
Comes down to size and experience	1

Q15. Is there one party that stands out as having the most conflict/difficulty with the method? And how so?

With parties having conflict/difficulty with DB, Designers mostly noted themselves (Designers) and Contractors: stating Designers have issue with the change in clientele, and the liability passed onto them by the client; and stating Contractors treat consultants as subs (and not partners), and are not used to being scored. Contractors mostly noted the Owner: stating they fear losing control, are too demanding during reviews, are unclear in their parameters, and think lump sum is guaranteed maximum price. Inspectors mostly noted Designers: stating their need to adopt a new mindset when working with contractors, their issue with working on a construction timetable, and their being caught in the middle (having to meet the owner's design requirements, but with the contractors as liable).

Table E-17: Responses to DB Party Conflict

Designer Responses	**Times Noted**
Owner – lack of understanding of how to implement a DB project	1
Designers – cannot find a partner (if FDOT does not like a designer, contractor may lose the bid)	1
Designer – dealing with (1) change of clients and (2) the interests could go in two different directions	1
Designer – client passing liabilities to DB team	1
Contractors – quality is price of product	1
Contractors – contractors treat consultants as sub-contractors, but if anything goes wrong, they always look at consultants to be responsible for everything	1
Contractors – not used to being scored	1
CEI – expecting Designer and Contactor to align against him … and they're not	1
Utility companies / permitting agencies – utility companies don't have budget or staff power / permitting is difficult; slow to approve review	1
Contractor Responses	
FDOT – being clear on the parameters (on what they want)	1
FDOT – think lump sum is guaranteed max. price	1
Owner – fear of losing control	2
District staff – too demanding when doing reviews	1
Designer – switching masters	1
Contractor – subjectivity	1
CEI – they still have all the rights, but under contract with DB-er	1
Subs – no difference	1
Utility companies – hard time with the compressed schedule	1
Inspector Responses	
Owner – primary issue is timeliness (DB-er on tighter design schedule; FDOT not on that schedule)	1
Owner – reluctance to accept change	1
FDOT – not in control	1
Designer	1
Designers – require a different thought process because now working for the contractor	1
Designers – do not want to accept design that is not preventable in the contracting documents	1
Designer – caught in the middle; liability is usually the contractor's but the department says it is to be designed a certain way	2
Designers – have problem working under a construction schedule	1
Contractors – can't manage design completion or sequence needed to complete job on time	1
Contractors – all responsibilities are on them; their risk is higher than designer's	2
Consultant – not in control	1
Always the smaller/less experienced contractor, designer, or owner	1

Q16a. Is FDOT District ___ handling DB differently than other DOTs/districts/agencies?

[Given the nature of this question, and the variability of responses, a proper analysis of this question cannot be made as it depends on the breadth of experience of the individual respondent. As such, and for the benefit of the district offices, the responses for this question are solely presented for review.]

Table E-18: Responses to DB District Handling

[District 1]	Respondent	Times Noted
No difference	Designer	1
Don't know	Designer	1
Handling it very well – not the low bid type but the weighted average (that's what they do most). Not a lot of low bid coming from D1. What concern me most is small consultants do not get opportunities in this arena – if the project is too large to handle by small consultants, then small consultant never gets a chance. It's only the big consultant firms that get all the opportunities.	Designer	1
[District 2]	**Respondent**	**Times Noted**
No	Designer	1
D2 has a lot greater success	Designer	1
D2 seems to be the one that works really well with vetting (i.e., bringing design options they will discuss the pros and cons so you know if it'll be acceptable to them before the end of the design process … but at the same time, they want all changes to come in at the design process – don't want to leave it up to you to meet the standards) / D2 – openly willing to discuss	Designer	2
Yes, every district has unique ways of handling DB	Contractor	1
Same as other districts	Inspector	3
During the acquisition process, our ATC process in D2 is definitely the leader. For this part, we have done very well / CSI part, all districts are doing it differently.	Inspector	2
[District 3]	**Respondent**	**Times Noted**
Don't know	Contractor	1
Florida is on the forefront of DB / D3 broke ground on DB and does a great job / D3 re-wrote Material Sampling Guide for DB	Inspector	1
D3 is handling if differently than Alabama DOT	Inspector	1
[District 4]	**Respondent**	**Times Noted**
Depends more on the procurement team (owners, engineers, owner's representative). Wouldn't say its district related. And different projects have different priorities, so they're handled differently.	Designer	1
Not sure	Designer	1
Construction fairly same throughout / Procurement different per district, but fairly consistent / D4 is more flexible	Designer	1
No knowledge with other DOTs	Inspector	1
Of D4, D6, and D8 … all handle it differently / D4 handles it the best … D8 is close second … making D6 third	Inspector	1
[District 5]	**Respondent**	**Times Noted**
Yes	Contractor	1
Same	Inspector	2
Don't know	Inspector	1
[District 6]	**Respondent**	**Times Noted**
No experience	Designer	1
Administrated differently because of people and not necessarily district differences (i.e., personal nuances, location, demographics, etc.)	Contractor	1
Of D4, D6, and D8 … all handle it differently / D4 handles it the best … D8 is close second … making D6 third	Inspector	1
Can't answer	Inspector	1
Really don't' know (Did DB in D1 and D4)	Inspector	1
D6 is pretty responsive on the design side	Inspector	1
[District 7]	**Respondent**	**Times Noted**

They've gotten better in last 5 years / FDOT is decentralized, but with DB they've gotten more consistent, predictable, and reliable in the last 5 years (more consistency in their DB process than anything else)	Designer	1
Different from everybody else / D7 is the most difficult to deal with / Issue is education – they handle DB like DBB	Designer	1
No comments	Contractor	1
[District 8]	**Respondent**	**Times Noted**
Experience with the turnpike / I've done DB projects in every district but 6 / all have nuances – trying to do things similarly / For the most part, all very similar	Designer	2
Of D4, D6, and D8 … all handle it differently / D4 handles it the best … D8 is close second … making D6 third	Inspector	1
Of D4, D5, D7, and Turnpike, I prefer Turnpike best – more like a business, they "get" revenue – they get that the customer is a paying customer … their sense of urgency is different than any other district	Contractor	1

Q16b. Is their method of handling DB better or worse than other DOTs/districts/agencies?

[Given the nature of this question, and the variability of responses, a proper analysis of this question cannot be made as it depends on the breadth of experience of the individual respondent. As such, and for the benefit of the district offices, the responses for this question are solely presented for review.]

Table E-19: Responses to DB District Handling Differences

[District 1]	**Respondent**	**Times Noted**
The methods for this type of DB is the same as state wise	Designer	1
I think D1 is better	Designer	1
D1 is narrow-minded	Inspector	1
[District 2]	**Respondent**	**Times Noted**
D2 is the leader – making it transparent and fair	Designer	1
Better	Designer Inspector	1 2
No better, no worse.	Contractor	1
Same	Inspector	2
[District 4]	**Respondent**	**Times Noted**
Not sure	Designer Contractor	1 1
Not any worse – just as good as others / Depends on who they put on TRC (needs to put best people, not who's available)	Designer	1
D4 is better with handling DB	Inspector	1
No knowledge with other DOTs	Inspector	1
[District 5]	**Respondent**	**Times Noted**
FDOT in general has no peers that I am aware of as far as understanding, skill and enthusiasm in handling DB. However, the level of scrutiny in design review varies by district and D5 is fairly reasonable. Scoring is basically random, both within and between districts.	Contractor	1
Same	Inspector	1
[District 6]	**Respondent**	**Times Noted**
Can't say	Designer	1
No – don't' think any different, at least on performance side	Inspector	1
[District 7]	**Respondent**	**Times Noted**
Similar	Designer	1

Worse	Designer	1
No comments.	Contractor	1

Design Build: FDOT Task Order Issue Questions:

a. Regarding special provisions that are specific to project contracting methods … are there any specific items in the special provisions that are ambiguous and/or can be improved upon?

Table E-20: Responses to DB Special Provisions

Designer Responses
Too many specifications
Do not know
No
I try to stay out of special provisions. So I don't know.
Not that I can think of off the top head. One of the special provisions is an issue because the way RFP special provision are written, makes it difficult for them to stay behind a subjective grading
Not sure.
Not that I know of
Everything can have improvement – but can't think of anything specifically.
Contractor Responses
Utility issues
Nothing comes to mind
Scoring is completely unpredictable and is basically random.
Sometimes the requirements change just before the bid when it is too late to change the design and cost. For example, a project required a 75 ft median. Two days before the bid opening it was changed to 25 ft. In another case, the RFP said use of sheet piling is not allowed, but the low bidder used sheet piling in his bid.
Nothing specific
No comment -- we don't draft them
Inspector Responses
Can't think of any now
Can't say -- nothing for DB
No
No ambiguity. / But, there is a voice from the industry that we have heard locally, about choosing the technically responsive vs. adjusted score methods. It is not ambiguous thing. But, contractors perceive that adjusted score introduces subjectivity in selection in the terms of how the package is written. / So, that is the only thing related to anything with that I can think of that is really an issue.
None
RFPs should refer to special provisions for DB and make sure contractor know about them.
I do not know anything specific. Add some language to get a superior design. In other words, do not just meet the minimum. Then, that would help us to get a better product. / Yes, the provisions on unforeseen conditions (e.g., A+B). It is a little ambiguous. The part on utilities is the same thing.
(not much experience directly with DB)
At this point, I would say no

b. Did the contracting method have an impact/effect on the QC/QA process? / Did something in the contracting method alter the QC/QA process?

Table E-21: Responses to DB QC/QA

Designer Responses
Yes. Time impact to QC (manipulator -- from before) / Time is a main factor
No, hasn't change / No
No. Contractors have to meet PPM and RFP anyway.
The QC/QA process used for DB tends to be exactly the same as that for design contracts. Every time you submitted to DOT. They don't look at it as the separate thing. To them it's exactly the same thing, so they go through same thing. So you encounter the delays and it may not be that significant on the design contracts but become very significant in DB contracts. I will give more room for designers to work things out as they go. We have to force ourselves to make sure that everything is exactly as the department expects, which is not bad, because that provides better product on paper. But it does delay the process. I wish I could be able to start sending information to the contractor in the field and have him start working on things sooner than what the system allows me to do right now. That, in the end, has nothing to do with the final quality of the product, but it has to do a lot with how the department sees it or how much confidence they have in that end. The results are going to be the same. Right now everything has to fit in the same parameter, and that may be a disadvantage on the DB process. / The DB process should be a little faster to allow them to move. Because design is in process of completion, it's not been completed yet. / It seems to me that there could be a little bit different approach to the whole thing. Maybe the reviewers, the CEI people would kind of work together sooner in order to exchange information maybe during the process meetings that would allow the contractor and designer to move faster and get things resolved as we go. In the end, we still have to submit a record that's up to standards. It's just a matter of time, a matter of process as well. It won't reduce quality at any point, other than a tweak in the process to benefit or adapt more DB than right now what's happening."
They had to make sure they submitted their QC plans with their regular plans. But I wouldn't say have any impact/effect on it.
For us, the process is not any different there is obviously a bigger magnitude in the errors. If there are any because of the language in our contract with contractor. But from a pure method in the QC/QA process, it would be same for anything that left our office.
QC/QA has to be done along the march, rather that when the plans are complete/ready for QC.
No
Yeah – DBB has more time for QC than DB. Probably more issues in construction than with DBB.
Contractor Responses
Yes. The QA/QC process does a lot of redundancy. The Contractor does it, the CEI checks them, and then the DOT checks them.
Not really -- processes are the same
No impacts
No difference.
No
To me, it's the same work, same specs … whether DBB or DB, same spec / (better question to QA/QC contractor)
Inspector Responses
No
Probably not
Don't see how DB has effect on it
Not much difference
No difference on the construction side. We have same testing procedure and QC/QA requirements. / On the design side, there are somethings that are not reviewed as we would like to. CEI complains about the quality of the design. Some of the stuff has to be reviewed. Some of them have relationships that worked together for so long now. That double reviewing is something that is wrong. So, there has become complacency. Introducing the concept of work at risk. So, if they have a set of plans, they go ahead and work. But, I am not comfortable with that on our side. (e.g., they proposed MSE wall but the drawings do not have any information on foundations, utility information. For drainage lines, we need all that information to evaluate what you give for an MSE wall. So, there has been a contest there with that side of the equation during that design process. So our guys have to up the game on that and do their homework to know what is out there. Where is the rest of this, we need the

other piece? Design quality of plans is an issue. Part of it is because contractors want to minimize design percentage or cost. We watch them struggle. I think it is fair to say that you can see that going back and forth. Kind of nice not to be in it. / Designers want to reduce their workload so they sometimes miss something.
The relationship is different. Construction-wise, we are shifting some of the regular duties that are performed by the owner onto the contractor. As an example, I would use the certification of foundations for bridges or for any miscellaneous structures. DOT used to certify the bridges, but on DB, this responsibility is on the DB firm. So it is ok the way is right now. As for other stuff, QA/QC is the status quo between both jobs. / I do not like that in DB, there is a clause that every RFP that I ever look at, that says prior to having a release for construction plan, you can build at your own risk. That kind of eliminates the QA/QC process in my opinion. Because we are building and then ask them questions later. Some contractors take advantage of that, some do not. But, there is clause so you can proceed at your own risk. That is from the design side of the contract. I do not like either. How do you inspect something that is not finalized in the design? How do you hold people accountable for a design that is not finalized? It makes it difficult for everybody. All these are permanent features and some of them cannot even be removed. So, when the contractor fall goes on its own risk, that is something the department would be accepting in the future.
Of course it does – QC process has impact because personnel assume a certain level of control with DB, contractor always has ability to change that – always an issue for inspectors … contractors have to get it certified …. still getting jobs delivered, just differently
Yeah, one issue: back to DB projects – a lot of incidences of lack of QA/QC due to time constraints. Should be strengthened in DB projects

c. Are the contracting methods typically appropriate for the project types? / For projects with bonuses/incentives, are the values set at an appropriate level (i.e., do the values properly reflect daily road-user costs)?

Table E-22: Responses to DB Appropriate Selection

Designer Responses
Yes / Yes, more than enough (way too good)
Yes -- haven't seen too many contracting methods / No -- too low (have to get bigger to get our attention)
Cannot comment on the appropriateness / Yes, the bonus values are set at an appropriate level.
It's just about every project you have out there on the market right now. If the plans were prepared for 2009(?) we would complete the center plans in 2010. They wouldn't be out for bid sometime in the next year 2011. The contractor would probably not get to do the work until 2012. That spending of time will also generate new standards, new ways of looking at things, new rules and requirements that would affect the project, that would cost also change orders eventually or some type of discrepancy that somebody would notice and cost delays. Right now it seems like everything is happening faster. We finish plans today, and they are out in the market next month. Things are moving faster, but the DB process pretty much takes care of all that in a much more efficient way. / Yes. I personally always had an issue with that because I never know how the liquidated damages are set on a project. There has been need which the project has been completed as been used by the public is not costing any delays 21(?). But for some specific reasons which has nothing to do with the operation of the facility. The closing of the contract get late and the contractor incurs into the liquidated damages. At that point, there is no one being damaged. / When we talk about liquidated damage due to delays, we need to be talking about benefits of early delivery.
The sidewalks I was involved in the DB. I don't know anybody officially said that that probably was not a good idea to use low bid DB for sidewalks like that. / I have never been involved with the project that type.
Not sure.
In general, always several ways to do a job – comes down to choice. District makes determination if its LS … comes down to peoples' preferences / (worked for construction manager that never liked A+B, so we never put up contracts that were A+B) / Yes
Complex vs. non-complex – straightforward more appropriate for DB. / Don't have experience with – bonuses are usually with the contractor.

Contractor Responses
Yes. It makes sense.
Yes
Tricky subject. Who are you going to go to for feedback on bonus impacts? Contractors will always tell you they are too small and have timeframes that are too aggressive. That being said, bonuses are too small and frequently too aggressive. Turnpike used to use them quite regularly and they were liberal. I know that makes people nervous, but there is a lot of value to putting a hard cap on a project, even if it is a little looser than you would like it to be. In any event, if a bonus deadline is too loose, it gets factored into the cost calculations anyway (which is a good thing for FDOT).
No to the first question and don't know to the second.
Yes / Hard to determine. Penalties for lane closures past allowable time are severe, yet we don't see bonus in like amounts.
No, not for the risk that you take – too low – not much of an incentive / 300 million man hours – 300 million chances of running into a problem
Inspector Responses
Yes / Yes
For type, they have been. / Yes, for the projects I've been on
Yes, for the most part the project we have gone with DB worked well. We miss once in a while. / No number /distribution limit on what type of delivery method to use
Yes. Overall we are satisfied. / We are especially like DB and have done very well, especially with design build delivery. We would like to see more lump-sum because that is easier for us from the administration standpoint. The people putting the package together and doing estimating do not like Lump-Sum because they do not have a unit price and everything. So, by doing lump-sum, they lose that database. / There is another thing. We struggled with Disincentive and incentive's bonus and used to forecast them for the whole district 10 years ago. We have very few disincentive and incentive. If [name] and I would look back on projects, we would get mad at without incentive on that. So, we got to be more focus to the future in doing that. It is an awareness. Those guys in their office know their conditions in the area and know what their high spot is. They know what they will get complain about. So, there is any types of incentive and disincentives, bonus, I think that the area we need to do better on. / District 6 in Miami is very proficient in setting incentive and disincentive. We can learn from their best practices because they are very proficient with it. / We are good in setting the amount of bonus. With other incentives, we are doing consultant monitoring incentives. We are doing an experiment based on daily cost and vehicle cost, use cost. We did evaluation for 70,000 dollars a day, our bonus to contractors was 10,000 dollars a day, the CEI was 2,000 dollars a day. So, what is the correct number? It is very subjective. That is a loaded question. We put a bonus on every interstate resurfacing job. The contractors get automatically a bonus for quality on any jobs. They also get bonus for fast delivery. But, for purely incentive related to time and get out, I would do interstate resurfacing. I think that is most dangerous place to work and that is most vulnerability, and most smoothable, too. And also with resurfacing, especially now, we have been on the cold front. But, with that cold front, they cannot pay for 100 degrees. So they go south. When they get back and then start somewhere else for two, three weeks. So, we can get in there and keep in there and get off. We as an agency can get a lot of benefits.
No
Yes
Typically, yes, appropriate. / Yes, they are properly assigned based on the fact that these values are chosen because of the impact on the public or road users. The higher density you have in the area, the more road you use, you will have the more incentive to have. There is a formula determining that. As far as contractors, front cost, or the cost for them, that may be something we need look a little closer at. But, I think in general terms; we are looking at the impacts to the road users and traveling public. So we want to get out of there. So these impacts are probably more closely tied to them vs. tied to the contractor's efforts. / It is public money. It may not be sufficient for contractors, but it is fair. One of the biggest constraints for this, when we try to deliver, we have commitments with the community, TPOs, MPOs, regular communities. We try to spread funds all throughout. We try to fit as many jobs as possible within the tentative time line. Sometimes, some people do not look at very well because you might think this is giving money away. But, there is benefit to add incentives to a job.

They can be – was a time when contracts (every contract had incentive on it – even on resurfacing – that was overkill) what nixed that was the downturn in the economy … what you saw was contractors chasing bonuses, and they would drop minor issues … now contractors dealing with downturn in economy – bare bones to win the job, and get it back in request for equitable adjustments … FDOT putting bonuses back into job (5/6 years) … contractors had been arguing over the past 5/6 years and were winning, and now they have the same mentality / appropriate to put bonuses on them … not on every job … what is the commitment to the public … big jobs may not necessarily need one / DOT has done a good job of identifying that.
Would say yes / Yeah, can't comment – haven't really worked on bonus project. On some disincentives, not really reflective on value (i.e., asphalt adjustments.)

d. Regarding how the FDOT distributes projects by contracting method … are they picking the right projects for their program (i.e., are there enough DB vs. LS projects)? How can they do better?

Table E-23: Responses to DB Distribution

Designer Responses
Yes
More DB than other -- "savior" for hire
(At least half good for DB) / LS have to be simple -- contractors don't have ability to pull quantities the way designer can (easy for them / quantities should be simply derived)
We went through a very special economic depression time for the past ten years. All of sudden back to the early 2000, we had enough work and nobody seemed to think much about the money being distributed. There were plenty of opportunities. All of a sudden, things began to dive; things began to dry out what was in the public and private sector. Eventually, in the past four years, there was more money to invest. The first thing that happened was the huge projects start to come up. Huge projects, we are taking about for the DOT, for instance, the I-4 extension through Orlando, 2.6 billion dollar project. Like that there were several DOT projects huge in magnitude, which immediately open opportunities for the big companies, which is good. But it took a long time before the smaller companies have any opportunity at all. / One of the things that the department need to be more cautious of, I believe, is how actually the money is going to get to the entire industry as a whole, not to those who has the buying power through the rough economic period. / I don't believe that the distribution has been fair because I can say there is a whole bunch of small companies that have to close in the past five years, only because there was not enough work. Or they were bought out by large companies, which have the buying power and contracts to allow them to do it.
Yes. The spread now is that the bigger projects get the DB. I think there is a good mix of the projects right now.
Not sure.
Tough to say – comes down to project / To do better – be aware of why they are picking one method versus another
Contractor Responses
Yes
Too much DB. I like LS, but there are problems w/DSC.
How can they do better? I have never understood why lump sum is not used for regular projects. Lump sum forces the contractor to really focus on his estimate.   Also, an unbelievable amount of time and money are wasted on petty, arcane arguments about pay item issues.
District 7 doesn't do too much DB project. It seems projects of more than $100 million are more appropriate for DB.
Yes, DB or LS, low bid jobs … believe their split is appropriate … [not so sure DB works on a large complex movable project]
Inspector Responses
Yes
Haven't seen LS -- it's been either pay items or DB / Usually smaller push-button
Want to see more DB -- department is cutting back

We are not using low bid too much. We are using adjusted scores now. I do not recall one recently.
We would like to see more lump-sum, incentive and disincentive.
Yes, generally it is good
I think we are fine. Management is making the right decisions on certain types of project. So I think they are picking the right projects for DB jobs.
Guess they are … don't do enough LS – they should consider doing more of
In general, yes

e. Regarding the use of Adjusted Score vs. Low Bid for Design Build projects … is the FDOT selecting the right method for the right project based on project scope and complexity?

Table E-24: Responses to DB Method Selection

Designer Responses
Yes
Neutral
No -- don't believe low bid has place in DB
Yes / Complicated projects usually use adjusted score to give more weight on some technical design, for example.
I believe so. For what I have seen, there has never been an issue on that. There was one instance, in which a low bid design project that I can think of should be in the adjusted score contrast. Especially the District 2 which has been used it the most is very good at it. District 5 has been good at it. District 1 doesn't use much of it.
I think they are doing it right. They are always outliers.
Not sure.
Don't particularly like low bid for DB … so answer may be skewed / if you do a project DB, it should be Adjusted Score
Adjusted score should have more weight than what they assign to it – if they truly want innovation.
Contractor Responses
Yes
Yes. They do a good job. But the adjusted score should have more weight than it does.
They are now, which is a change. This came from a recent rule change.
Some projects are not appropriate for DB. If appropriate adjusted score is the right method of selection for DB projects.
There should be very few Low Bid DB. Only when there is immediate need for simple projects do I believe this is prudent. Low Bid, to me, is contrary to true Design-Build.
I think they are utilizing it correctly
Inspector Responses
Yes
Would say so, yes
In my experience -- score doesn't matter / lowest price usually wins
Low bid has not been used recently. Only adjusted score is used
I think we are now. We have improved.
Yes, most of the projects I worked on used adjusted score.
Yes. / If the project is more complex and big, we may up to go for adjusted score. When the risk is medium, not as complex as full urban reconstruction, we would go with low bid and would be adequate. When you are not looking for a very innovative method to construct things better and faster. I can lean either way; I would go more with adjusted score. Sometimes, the contractors are not experienced. May end up winning the job, even if there are certified and quailed in that work category, they just do not have that experience. And they end up taking, not doing work. / For shortlist, because they are graded, based on their technical content, you can see that a contractor and design firm as a team knows what they are going to deliver, which may not be the minimum. So you give them a better product that way. It eliminates loopholes too.

No … don’t … what you do see is 99.00% of time, adjusted score – almost all see the low bid win … before you get to the shortlist (initial section, letter of response … if you get 7 firms, in the top 3, 4 you have a good chance of winning – not looking at score, but at the ranking – they’ll stick around to possibly shortlist … may have some ATCs that will bump up your score … contractor will decide if they want to continue on --- those in the top 3 or 4 will probably win the job)

f. **Is the RFP clear enough to do your job (e.g., design criteria clear enough for designers)? Is the RFP too restrictive to integrate innovation into the design/construction aspect of the project?**

Table E-25: Responses to DB RFPs

Designer Responses
In general, good enough. / Not restrictive (haven't run across that).
Most of the time it's clear -- maybe too much info. Would all do better if there were less (too restrictive) / Should tell us what they don't want
RFP is clear / District 2 allows modification to encourage innovations
I would say yes with a little caveat. One of the hardest things to deal with is the addenda close to the end. The timing of those addenda are difficult to deal with. / I would say no. Now it’s kind of balanced.
It usually is. / No. The whole process is good.
Yes / No
Yes. / Yes. It isn’t too restrictive on my side of the table. It’s more on the owner side of the table because they get down so far in a certain concept where all the language is going in the RFP ends up being more descriptive toward certain concepts.
Sometimes, but usually teams are allowed to ask for clarifications. / Sometimes it is very restrictive.
All depends because RFPs are altered for each job, and I know they are trying to work on that because they have a boiler plate / sometimes it can be restrictive – how they allow you to do alternative design
Not for complex projects – that’s what costs money the most, unclear RFPs. There are ambiguous arguments about interpretation / Yes.
Contractor Responses
No. / Yes. Too restrictive.
Generally, if you have ATC, you're okay
Yes. Yes, but that doesn’t bother me. In my opinion, the value in design build comes from the collaboration among the parties.
It is not clear in expectations.
Yes / Yes
DOT is doing a great job of trying to make RFP clear … they have a template for it … there was a time when it was different / they’ve standardized it, and give you all the information that they have, so they’re good with that when it comes to what they want, they get a little too restrictive … don’t know the right balance there – would like to use DB for innovation and use a performance spec approach – change the way the CEI is paid – try using to experiment with contract administration … not just to get a complex job done sooner when design is not complete / use DB approach to test or try other means or modes of building a facility – a little bit of experimentation --- to try on one job and see how it is successful
Inspector Responses
Yes. / Sometimes they are -- especially bridges.
No -- need more info / ambiguous and conflicting. / No -- not too restrictive, but goes back to training of design managers
It is always a struggle. In some instances, we are doing well
Yes. / RFP allows innovation, but it depends on the type of project. Some projects are pretty straightforward; you cannot do much with it.
Something needs to be done in RFP to prevent minimums, but still allows innovation
Yes to part 1 and No to part 2.

Yes. It is clear. / That may very well be they feel it is too restrictive. What is driving their innovation is cost. And then, some of their solutions may not be the best ones.
Some RFPs have been beautifully written, others horribly – subjective to answer … sometimes contractor violates RFP – turns into claim and contractor wins it … if you've been in the industry long enough it is clear enough … before you go off anything else, you got to go off that
Think it is clear enough – somewhat restrictive. Department should provide more flexibility

g. Regarding the selection and evaluation criteria for DB projects … is the criteria good enough or fair enough? Do you have any concerns?

Table E-26: Responses to DB Evaluation Criteria

Designer Responses
Good enough -- in general
Good and fair to the extent that TRC is educated on the project (if not fully evaluating it / not putting a reciprocal interest on their end is not fair) / (TRC should be looking at just that and nothing else)
Yes. / Review process may miss something.
I generally think it's good enough. But one of the things is from the designer's perspective; many of the processes are inconsequential. I can do them for free; the contractor bid projects carry so much weight.
It ends up being a matter of who's capable of spending and what it takes to put a proposal together. Because on some instances, there is a stipend offer and some other instances there is none. But before that, when you put in together your letter of interest, which some instances is limited to five pages with attachments or that. Even for that effort, it all boils down how much your company is capable of investing and put that together. It becomes a true art to do it. It's not just anybody can do it. So I say there's got to be a way to make it fairer for everybody to participate because not so many companies can invest ten thousands of dollars and put a letter of interest together, which is not feasible for other smaller companies to do it. / Smaller companies cannot afford investigating when the situation is not low bid type.
I haven't been involved in the selection and evaluation of the DB firms. So I don't know.
The low bid still predominately carries the selection. I do have concerns because I don't think the department ultimately gets the firm they want that they feel comfortable with. I do have concerns that department is not getting the best value selection.
For the most part price is the most important portion.
Only concern I have is with schedule portion – generally they distribute the points between design, construction, innovation and schedule – and don't like when the schedule is so tight it's almost impossible to deliver it that quickly / contractor will try to do it quickly, but to also give points for a short schedule makes it hard to deliver the project on that short a schedule
Think it's fair enough – whether it's graded that way is another question.
Contractor Responses
There is a human element in there that is hard to get rid of. / There is a wide variety of scores among members of the selection committee.
No. We don't know how the scoring is done. There seems to be no standard. There needs to be a connection between the dollars and your score.
Considering the political problems surrounding this issue, I believe FDOT is making a good faith effort to do a good job with this issue, but in the end, scoring is completely unpredictable and is basically random. Design-build projects are becoming more difficult to procure and this is a threat to the program. When FDOT had firm shortlists, things were better. The shortlisting procedure has been "reformed", but it is making things worse. I am embarrassed to say I don't have any specific recommendations to fix this; it is a very complicated issue.
Highest technical scores normally don't get the job / Reviewers should have expertise to look at different approaches to the design of a project and recognize creativity and benefits of the proposed design / Reviewers try to keep the scores close.
Depends on the project / Yes

Only comment on evaluation – they can choose 3 or 4 they like and make it a price race, not enough with the scoring.
Inspector Responses
Yes
I think it is. / No
For evaluation of technical proposals -- scoring vs. money, scores don't always matter
We have a 2-step process based on feedback from the industry. They requested that instead we shortlist contractors, we score them based on letter of interest. We give them the score and give them 2 days to let them decide whether you want to move on or not.
Yes. / Our contractor is very vulnerable. Our industry is vulnerable. And they do not care for it. As I sat in most selection committees for design build, we struggle. You want to evaluate the requirements for the first part of the evaluation, the experience and qualifications. I think we as an agent get challenges about that, a lot. We have worked with a lot of contractors and designers, and know their experience and abilities. The contractors get upset when we truly call it as we see it because they say we are prequalified with the department here, who are you to judge me? So, the fact that they are qualified for major bridge, should not be there. We should be able to add some subjectivity by saying we like this team better than that team. So, it is made for our technical review committee members to truly call it as they see it. So, that first part of the grading which is like 20%, we see our technical committee members maybe have tied up their scores that are not as spread out as they need to be. Simple because of the voice of the industry. These guys get to work with them every day so you do not want to piss them off. So I think that is more a problem right now than it is ever being. / 80% is on the technical part. What we do to our guys is to ask them to know why they give them that score. They have to be able to back up what they say because the team will come to you and put you on spot. You better know what to say about it no matter what kind of score you give. So we are very careful. Our guys are very good. Now, maybe call our relationship is used. You know some teams cannot work together. We are going to struggle the whole way. You have to be careful how you back your design criteria. When we are grading these design build teams, we are conscious of that. It is nag in the back. If they are selected, they like the method. If not, they complain. Even though they are treated the same as other teams, they will make it an issue. We explained in front of others. We do have sour losers.
I think it is fair enough. I do not like the low bid DB because you tend to give the opportunity to an inexperienced designer or contractor. I want to be able to see one is going to be the best team.
Not knowing in my line of work – more in the administration
Criteria is fair enough, concerns about department looking back at residual.

h. Regarding stipends for DB non-selected bidders … do compensation values accurately reflect design workload?

Table E-27: Responses to DB Stipends

Designer Responses
No, lower than what it should be (not reflective for ~60% plans, not enough)
No. Now they're covering 60% of cost / in the past it was maybe 30% of the cost / Too much risk for the savings they're getting for innovation / Should be paid 70% or 80% -- doesn't need to be 100% / 2 is okay -- keeps competition
No / The losers may lose money. / FDOT shortlists an average of 4 contractors.
The intent of the stipend does not completely cover the design workload.
I guess it has to be on the case to case basis. A few instances that I have been a participant on, there is a previous agreement between the contractor and the consultant as to who is going to get what in case the stipend gets bid. There are the instances that the contractor gets the whole thing, they did not give anything to the designer.
I don’t know.
Never. They are getting better. The new formula probably covers 70% of the efforts.
No

Certainly do better than they used to, but no – they can never reflect the design workload / also disagree that they pay only two – should be expanded, maybe on a point range or sliding scale because a lot of firms walk away after putting in a lot of work
No. Absolutely not. Doesn't pay for our cost. Think the DOT is trying to limit – so it's fine they're only paying the top 3 … but they should pay more. / They use the other designs – not compensating them.
Contractor Responses
No. Should be bigger.
We get enough now. Last year we didn't.
No
No. Significant design efforts are needed for projects more than $10 million.
Recent changes have made the stipends fairer. I still think that stipend should be paid to more teams.
Think it's a bargain for FDOT – get six to pursue and then only pay for two / they have upped the stipends … designers were more concerned with this than contractors / [DB more expensive to pursue because cost more time – taking time on this job and not pursuing others … stipends do not cover costs] / for designers, they can't afford to just to it exclusively / in general, too small and too few …. 3-7 … they should up it to at least 1 to 2.
Inspector Responses
Probably not -- concern I hear from Designers and Contractors
Don't know
Yes, we believe they do.
We hear constantly no. / They will tell you that "thank you DOT" for getting stipends back because we went off for a period of time and we would not be able to get the bonus at all. So our leadership did a good job with legislatures convincing them what they do and what you are getting from that. And we do own designs, so we do have a tangible benefit for that. They can be embraced by another bidder. But, the designers will tell you what they are getting what should get.
No answer
Yes
No. We had this kind of conversation with designers after the selection process. I personally think they put a lot of efforts in coming with ideas and different design concepts. We recommend increase the stipends. One thing to point out. They do not do this for all projects. Just for project with adjusted scores. It depends on the complexity of the project. We do shortlist, so some design firms choose to their own account. I agree that they should not pay, that is their own option if they want to move forward or not. So, basically, if they are not shortlisted but still decided to submit, they should not be compensated.
Would imagine that everyone says … on DOT's side, not going to spend money on all the firms … Florida is pretty far ahead of the curve with stuff like this (other DOTs do not provide stipend)
No. Not even close.

<u>Design Build: Conflicting Issues</u>:

- **79% of contractors <u>do not</u> believe unit costs are lower, while 52% of designers and 55% of inspectors believe they are**

Table E-28: Responses to DB Conflicting Issue #1

Designer Responses
Contractor bidding just as hard regardless of type (of delivery system) … but designers, for DB, you turned designers into bidders / fees lower because they are doing it to get the job
Agree with the designers
As a designer or inspector, I am going to look at things in a totally different way as a contractor. As a contractor, I am looking at my investment on the bond and how much money I can get of the project. I will not agree that I am

going to lower my unit price to get a contract. I am going to see the market. I am going to see everything from a different perspective. As a consultant and inspector, I am saying that if we can save money here; obviously the cost should be less. If I can do it faster or I can get local materials, I can always be thinking that the price should be less. But that's not a person managing the money or being the final bottom dollar needs to think. As a contractor, the contractors are always going for the largest margin. / If I am a consultant, the cost should be less. But I can't be a pure consultant if I am in a DB arena. I become a hybrid between contractor and designer, when it comes to looking at unit price. Because now I am going to see what the market has been and what the demand is, and I am now taking considerations all the factors, as a pure consultant I wouldn't.
I am with the designer.
No opinion really … but think that contractors are bidding contracts they would know best) / thought that costs were going up
Contractor Responses
Unit costs are not lower, but I believe overall project costs are lower.
Believe it's a function of the job … don't necessarily agree with that (there is value in the design process – don't think costs higher or lower – depends on risk profile) / [DB is less so with risk … owner sheds risk on to DB – risk profile to DBB different] / engineer working with FDOT negotiates that work and often gets paid for rework
Inspector Responses
Disagree. Unit costs lower because competing for work -- not necessarily best job. / Negotiation with DOT to set price.
DB costs more because more risk built in. / Don't know how much saved on design side
They should be the same. Contract delivery methods will not affect the cost. There should not be a big difference. Asphalt is asphalt. What takes to produce it is the same. The asphalt is based on quality and location, or distance, a lot of variables. But, I do not think the methods can affect the cost. Maybe a lump-sum job would possibly, the contractor may add a little extra, depending on what type of lump-sum job. DB jobs are typically lump-sum contracts too. / At the time of bid, they may be the same or lower, but if we do a change, they are higher, significantly higher.
[Contractors are] Obviously going to say that … for lump sum single pay items, hard to say what actual costs are …. whereas designers will say absolutely lower because they know … designers cut their rates to get the job and they're probably putting it into overhead … CEI inspector for the DOT will get their rate – so those rates will always be lower
Agree with contractors – think overly optimistic.

- **67% of contractors <u>do not</u> believe cost growth is lower, while 75% of designers and 61% of inspectors believe it is**

Table E-29: Responses to DB Conflicting Issue #2

Designer Responses
Cost growth dependent on other work (supply and demand)
Cost becomes lower in most cases
I guess who is looking at the answers to this questions is also looking what's actually happening. Even though I, as a designer, thought that 300 per cubic yard was a fair price. In the end, I am seeing that its average 450. All I can deduct is the price. In the contractor side, now he is looking at the actual cost of the unit prices going down, but he is not talking about his profiting either.
I believe as well.
Have to side with the contractors
Contractor Responses
I believe cost growth is lower. I think the non-believers are talking about the growth of costs against their own estimate and not in relation to the original scope.
Risk profile is higher, so I have tendency to agree with that … when there is a situation (i.e., FDOT says lump sum – within the scope of the work) … not always in agreement
Inspector Responses

Unit cost is not lower
Think cost growth is lower
For design-build projects, contractors usually think they lose money, or they bear minimums. There is a few that make money. This is what contractors think too. For us, they keep coming back and being on the jobs so that they cannot lose too much. I think it is more aggravation. We have to take ownership and design and all that. I think that can factor into that answer. We spent a lot of resources doing design, tracking, coordinating. We can do it easy, design bid build job making the same amount of money quicker.
Contractor's cost growth will be lower, and will believe that because they have the ability and liability to change the design … i.e., if they believe there is misinterpretation of what is being done in the field … markups will overrun the project … actual cost of project will be like that in bid from DB because they may change the design … designers are making changes all the time so obviously their costs are going up … regarding inspectors, when design changes, everything changes
Think in general, any lower except when you manage to shrink schedule. Escalation is a little lower, but for general construction items, there isn't any general savings

- **69% of contractors <u>do not</u> believe DB reduces owner's/agency's control of design, while 62% of designers and 69% of inspectors believe it does**

Table E-30: Responses to DB Conflicting Issue #3

Designer Responses
No loss of control -- still have to meet criteria (don't ever want to be below design standards)
FDOT does have fair amount of control
It remains the same.
I believe it does.
It reduces some but the owner still has a lot of control.
Don't think they've lost control of design – they have standards … as long as they state it in the RFP and it's clear, and you ask what you want
Contractor Responses
Contract administration is completely different under DB. CEIs (inspectors) are way overpaid and if they do not have any legitimate issues they will manufacture petty, or fake issues to look important/busy. DB is administratively much simpler, but they are not allowed to report back that everything is fine and they certainly aren't going to give back money under their contracts because nothing is going on. Therefore, they run around and stir up nonsense issues to justify their high contract values. I believe that this is what the "agency control of design" issue is really about.
Agree with that statement – DOT still approves design, you go to 30%, 60%, 90% design … don't see how they would have less control
Inspector Responses
Agree. DOT still maintains tight control. / See them doing things differently but still complying with specifications.
Owner has control of design (FDOT will put it in plans)
I think so. Normal DBB projects, designer would go in there and make it for the best for the public. While contractors are going to look at the minimums. So, we have a lot of control over design. I think part of our problem is whole work and risk. If he signs the deal, he can get back to the component plans. / By contract, you get into the work and assignments, even if I do not agree or I see some glaring problem. I just bring it into his attention. Then, I say I am going to work and I really do not have anything to say. I am kind of stuck. So, I do think we lost.
Interesting … I would imagine it does, but probably has to do with depending on the RFP they're reading (they know what they want)
Agree with contractors – doesn't reduce control of design

- **65% of designers and 54% of contractors <u>do not</u> believe contract administration is similar, while 69% of inspectors believe it is**

Table E-31: Responses to DB Conflicting Issue #4

Designer Responses
With contractors, they have to do the same in the field
Agree with inspectors
There is no difference for a contractor. For a designer, there is a difference because now you have to put it in your budget, participate in more meetings, and go out more in the field, and do a lot more stuff. It's still within your budget, but it's a lot more activity. So talking about the administration of the specific project, you don't have to add more resources, but you have to add more budget. Yes, it does increase for consultant because his participation is more.
For my districts, it's similar.
It depends how the contract was set. If the contractor is to provide the inspection team and testing, or the client keeps it.
Not sure what they are similar to
Contractor Responses
Contract administration is completely different under DB. CEIs (inspectors) are way overpaid and if they do not have any legitimate issues they will manufacture petty, or fake issues to look important/busy. DB is administratively much simpler, but they are not allowed to report back that everything is fine and they certainly aren't going to give back money under their contracts because nothing is going on. Therefore, they run around and stir up nonsense issues to justify their high contract values. I believe that this is what the "agency control of design" issue is really about.
Contract administration is function of size – not if DB (federal requirements all the same) … have a tendency to disagree but have to go with majority – because of the size of the job and not because DB (experience is with large, so I have a bias)
Inspector Responses
Contract administration is the same -- just different methods -- still governed by the same specs -- more ability to be creative and save money than with DBB
Different than DBB -- disagree with 69%
Not really. I mean basically, the only difference is you are dealing within your record, who you are coordinating with. As for the processes, they are all the same for us. MOT and erosion, the same stuff, we are observing them. Just a little different, people you talk to possibilities.
When I read this differently. I would go in a different direction. Inspector's position is to check that materials on the field, check grade, check concrete, make slumps, the density, that type of thing. From the contract administration perspective, what we are dealing with is design build, review the drawings, permitting, contract administration, time extension, change orders. That cannot be different, but should be truly. It can be different specifically on the relationship of this contractor and this designer. We can see them not in sync, which can create more of a challenge from administration's standpoint. "
Oh yeah – with what I said before ... inspectors have to meet current and most up to date construction plan … inspection is definitely not that same as it would be for conventional
Would agree with designers

- **71% of designers and 60% of contractors <u>do not</u> believe there is a lower level of contention between the owner and the designer, while 64% of inspectors believe there is**

Table E-32: Responses to DB Conflicting Issue #5

Designer Responses
Think it's a little lower: when dealing with others directly, it's much better / too much power to third party consultants with procurement should be more DOT than consultants … consultants are paid hourly … livelihood dependent on comments

Do not see a lot contention between owner and designer
We always use the same standards and manuals. There shouldn't be any contention if we all looking at the same. / (Q: If there anything you want to add the topic that are not covered? A: One of the department's concerns should be, they have been made good efforts in the past to distribute the work better. They have fallen short and more needs to be done on that. I say they fall short not because lack of efforts but for the lack of programs that would allow better distribution of the resources.)
I don't know.
The engineer is working for the contractor in DB.
Think there's more contention
Contractor Responses
I believe overall there is less contention under a DB. There still is a level of contention and it has an impact on us (see above), but overall it has been my experience that the "spirit" of design-build collaboration is generally embraced properly.
Agree with designers and contracts – not a lower level / DBB has a lower level of contention – more straightforward … but mistaking lump sum with GMP – they're not the same
Inspector Responses
Same level of contention
Don't see much difference
What is interesting is that, depending on your DB team, that relationship between contractor and designer, their perspective of relationship with respect of the department or the owner. So, if the contractor does job every day, he is comfortable talking with them and they effectively communicate with their designer who is probably dealing with that contractor. If it is designer that we are comfortable talking with and contractor is not proficient or not a good communicator, we may have people from design side talk to designer, and the contractor gets upset, because you know the contractor is me. So when we see that adversity that is where it gets a little contentious. That lower level of contention, do not tell my design what to do because he is working for me. That is interesting.
Don't know if I have an opinion
Agree with designers ... no lower level of contention … typically more

A+B Bidding

Q17. Does A+B work well as a stand-alone method?

Designer respondents feel A+B works well as a stand-alone method. Contractor respondents were split, noting there is no penalty for those submitting a short time bid to get the job, and that the method is good if the specifications are established and the time enforced (implying that is not usually the case). Inspector respondents mostly felt it works well stand-alone, although they commented on rarely seeing it alone and that it works best with I/D.

Table E-33: Responses to A+B Stand-Alone

Designer Responses	Times Noted
Yes	3
As a contractor – think they do because it sets them apart from others	1
Contractor Responses	
Yes	2
No	2
No penalty for the contractors who submit a very short duration for the project to get the job – they will get time extension later to complete the work.	1
If the spec was set and the time is enforced, it is great	1
This is more of an Owner question	1
Inspector Responses	
Yes	5
No	3
Rarely seen A+B by itself	1
Works better with I/D	1
There needs to be I/D	1
Contractors generally very cautious with A+B	1
They'll hit you with I/D plus liquidated damages	1
Works well with the trains	1

Q18. In your opinion, do you like A+B?

The majority of Designers do like A+B, while the majority of Contractors, in contrast, do not. The majority of Inspectors also like A+B, and they make heavy note of its time benefits – saying they like it when time is an issue, it helps move the project, and it empowers the contractors to better control the schedule.

Table E-34: Responses to Liking A+B

Designer Responses	Times Noted
Yes	5
No	1
On certain projects	1
Contractor Responses	
Yes	1
No	4
Inspector Responses	
Yes	8
No	2
When time is a big factor	2

It moves the project (e.g., if contractor has extra time they'll move people to another project)	1
Best price, contractors bid too aggressive for cost (see them then get extensions – extensions are too easily given)	1
Empowers contractor to control schedule	1
Contractor sets the time	1

Q19. What is the best feature of A+B?

Designers, Contractors, and Inspectors all claim time-savings is the best feature of A+B bidding. Designers commented on the department getting the project quicker with A+B. Contractors commented on A+B providing an incentive to work faster. Inspectors also reported it moving the job faster, while also stating how the contractor can set and control the schedule, and how A+B provides the best value (giving the department more for its money).

Table E-35: Responses to A+B Best Feature

Designer Responses	**Times Noted**
Department gets project quicker – shorter schedule will get a better bid	2
Schedule – it's an important component	1
Contractor wants to finish early	1
Provides another component besides just the price	1
They better have right plans (clear and understandable), because that's what they're going to get	1
Contractor Responses	
Accelerates work	1
Gives incentives to go faster	1
Owner generally gets the lowest "contract" time	1
If you have the resources to finish the job quicker, you have an advantage	1
None	1
Inspector Responses	
Moves the job faster / Time savings	3
Contractor can rigorously control schedule / Contractor sets the time / Makes the contractor put more effort into his schedule	3
Get more for your money / Intent – better cost for short amount of time	2

Q20. What is the worst feature of A+B?

Designers stated the worst features are the tougher contract administration; and the contention between department and contractor (specifically when contractors want to add days when realizing they can't perform as scheduled). Contractors said the worst feature was how bidders submit unrealistically low bids just to win the project. Inspectors also make mention of this trend of bidders to submit low bids to win the job (only to then request more time); and how the DOT will grant extensions without penalty (and award extra weather days) in order to get the job done.

Table E-36: Responses to A+B Worst Feature

Designer Responses	**Times Noted**
Contentious for department when contractor can't perform, so they'll want to add days (which department doesn't want to do)	2
Contract administration may be tougher	2

Saves construction cost – not really saving engineering cost (e.g., to prepare lump-sum set of plan, our designer, as a project manager, still has to calculate the project quantity to come up with an official estimate)	1
Manipulation	1
Counterproductive	1
Personally, don't have any negatives about it	1
Contractor Responses	
If someone puts a ridiculous low amount of time, it screws everything up / Generally one bidder bids an unrealistic time	2
Competitor low-balls their time to win bid	1
It is too easily abused. It is impossible for an honest bidder to use it properly	1
Unforeseen conditions after award – no recourse	1
Inspector Responses	
Some contractors bid for a shorter time to get the job, but later on it will ask for extra time	1
To get the job done, DOT still grants time extension without any penalty	1
Time not a valid issue when you get into construction … weather and holidays automatically applied (40-ish days)	1
Without disincentives for the Contractor, it is worthless	1
There is no benefit to Owner if milestone is not met	1
If contractor did not set the time correctly	1
Combination with another process that interferes with contractor's pursuit of a (time) bonus	1
Costly for the contractor	1
None	2

Q21. Would you consider A+B a successful contracting method, as currently being used by FDOT?

Designers all felt A+B was successful as currently being used by the FDOT (although some did comment on not seeing it used alone very often). Contractors are evenly split on the success of A+B – saying the time component is too short (seemingly unrealistic, as noted in the responses above), and the department does not push back hard enough (or penalize, also as noted in the responses above). The majority of Inspectors felt it was successful, but mostly when combined with I/D or Lane Rental.

Table E-37: Responses to A+B Success

Designer Responses	Times Noted
Yes	6
Haven't seen it very often	2
Contractor Responses	
Yes	2
No	2
Haven't seen many lately	1
Time component is too short, and they don't push back hard enough	1
Owner question	1
Inspector Responses	
Yes	4
No	1
Only successful when combined with I/D or Lane Rental	1
Although not preferred – not for truly shortening contract time	1
I do not know whether we are using just A+B alone anymore	1
Not much recent experience	1

Q22a. Is Florida using A+B to its greatest potential?

Designers are split on whether Florida is using A+B to its greatest potential – some even commenting on it being underutilized. Contractors, by only a slight majority, do not think A+B is being used to its greatest potential. However, the majority of Inspectors feel it is being used to its greatest potential.

Table E-38: Responses to A+B Potential

Designer Responses	**Times Noted**
Yes	1
No	1
Underutilized	2
Don't know / Don't think I can answer that	2
Contractor Responses	
Yes	1
No	2
No opinion	1
Inspector Responses	
Yes	5
No	1
Hard to say	1
Only works with strong disincentives	1

Q22b. If not, how is it being underutilized?

The only relevant response from being asked how A+B is underutilized came from a Contractor suggesting to use it on every project (to increase familiarity).

Table E-39: Responses to A+B Underutilization

Designer Responses	**Times Noted**
How contractors manipulating bids (don't see need for incentive)	1
Contractor Responses	
It could be used on every project	1
It is only over-utilized	1
Inspector Responses	
(none)	-

Q23. What can FDOT do with the implementation of A+B to improve its use?

With implementing A+B, to improve its use, Designers and Contractors both suggest using it more often. Designers also advise there being more details provided, and their having more control over the entire process. Contractors voiced the FDOT putting a lower limit on the time as well as implementing milestone/interim completion dates. Inspectors recommend it being partnered with another method (i.e., I/D, Lane Rental, NEB), adding more disincentives, and tightening up time extensions in the specifications. Of note, one Contractor and Inspector felt A+B should not be used at all.

Table E-40: Responses to A+B Implementation

Designer Responses	**Times Noted**

Use it more often	1
Concept rethought – more details, more control over entire process	1
Figure out a way to make a dollar figure so we don’t have to recreate, to truly make it a lump sum	1
Not being in the construction side, don’t know how it could help	2
I don’t have the suggestion on that	1
Contractor Responses	
Use it more	1
FDOT should put a lower limit on the time	1
Milestone, interim completion dates instead of one	1
Increase LDs for A+B	1
Eliminate it	1
Inspector Responses	
It must be partnered with I/D, Lane Rental, NEB, etc. / No stand-alone	1
Put more disincentives in it	1
Tighten up time extensions in the specs	1
Shouldn't be using it	1
So long as stand-alone – that's where it can be most successful	1
Don’t think there's anything -- specs are very, very clear / Nothing	2

Q24. To benefit from the advantages of A+B, what does the FDOT need to do?

To benefit from its advantages, Designers felt the FDOT must be more fair/understanding in adding time to the schedule when needed. Contractors and Inspectors both felt to benefit from its advantages, A+B should be used more often; a good set of plans must be used; and they should strictly enforce penalties (with bidding unreasonably low and exceeding time).

Table E-41: Responses to A+B Advantage Benefits

Designer Responses	Times Noted
Be fair – part of reason why it’s contentious is because they feel they are giving up time … they are now on a tight schedule, so on one side they don’t want to give up time, and the other side wants more time … they should just relax and if time has to be added, they should just add it	2
Eliminate back doors (i.e., should rain days be counted -- they're being given the incentive)	1
Reduction of time	1
Come up with a method to create engineer’s estimate without doing quantity takeoff	1
Contractor Responses	
Use it more	1
Make sure plans are flawless	1
Enforce it against people who bid crazy low on purpose	1
Need more reasonable timelines – usually do it to accelerate schedule	1
Bonuses are much more effective than A+B	1
Don't know	1
Inspector Responses	
Do more of them / Put more A+B out in the market	2
Have a good set of plans	1
Always have disincentives – you must come down hard on the Contractor if they exceed the time, no matter what	1
Choose the right projects to use them and heavier disincentives	1
Limit to only projects that have a timeframe	1
No answer	1

Q25. What are your greatest concerns regarding A+B?

Designers believe the greatest concerns (and greatest potential problems) are unrealistic schedules and the loopholes and backdoors. Contractors believe the greatest concerns are varying interpretations of the project during bidding; lowballing of time bids; and subsequent time extensions and claims by the lowest (time) bidder. Inspectors believe the greatest concerns include getting higher costs for construction; contractors underestimating time (whether intentional or not); bonuses being too high; and not permitting time changes in their provisions due to uncontrollable circumstances.

Table E-42: Responses to A+B Concerns

Designer Responses	**Times Noted**
Schedule being unrealistic or hard to obtain is the greatest potential problem (i.e., time saving may not be achieved sometimes)	1
Backdoors, loopholes	1
Making sure we estimated everything correctly	1
Contractor Responses	
How different Contractors perceive the project when bidding (i.e., different interpretations can result in wildly different bids)	1
Time extensions and claims by low time bidder	1
Time lowball by competitors	1
Too easily abused	1
In determining the time, you must bet against yourself	1
Inspector Responses	
Getting higher costs for construction	1
Contractors underestimate time	1
Bonus may be a little too high	1
Does not allow time changes for circumstances beyond contractor’s control (i.e., changes due to holidays, weather, special events, etc.) – provisions should permit time extensions for these uncontrollable events	1
Time – from the public’s perception – when it won't meet the deadline	1
In designing good set of plans – investigate unknowns to not impede contractor's pursuit	1
Excessive many arguments with Contractor on things that cost minutes and pennies	1
Contractor that is inexperienced or inept -- would be disastrous	1

Q26. When is A+B a disadvantage?

Designers, Contractors, and Inspectors all felt A+B is a disadvantage when used with complex jobs. Furthermore, Designers felt it is a disadvantage with longer-duration projects, with smaller contractors, and when time is not a concern. Contractors also felt it was a disadvantage when there are a lot of utilities (or utility conflict), and when the staff is inexperienced and the plans (and MOT designs) are inferior. Inspectors also felt it was a disadvantage with multiphase projects, and when there are no time constraints, and when the contractor is poorly selected.

Table E-43: Responses to A+B Disadvantage

Designer Responses	**Times Noted**
For longer duration projects (e.g., 3, 4 years)	1
For complex jobs	1
For smaller contractors	1

When time is not an issue	1
Contractor Responses	
With a lot of utilities / with utility conflicts	2
Bad plans / poor MOT designs / inexperienced staff	2
Complex projects	1
During catastrophic weather event	1
Always	1
Inspector Responses	
Complex jobs – A+B should only be used on simple jobs	1
For multiple phases	1
When there are no time constraints	1
Wrong selection of contractor	1
Don't think it's a disadvantage – win-win for department and the public	1
Not sure	1
None	1

Q27. What types of projects do you feel works best with A+B?

Designers thought the jobs that work best with A+B are either time-dependent (shorter-duration jobs, or when time is of the essence) or capacity-dependent (those sensitive to traffic delays, and capacity improvement projects). Contractors thought the best jobs are simple ones, as well as those with known production rates and limited unknowns. In contrast, Inspectors thought the best jobs are complex ones. They also felt bridge jobs and those with milestones, or having a critical impact, worked best as A+B.

Table E-44: Responses to A+B Best Type Projects

Designer Responses	Times Noted
Shorter jobs (duration-wise)	2
When time is an essence	2
More sensitive to traffic	1
Capacity improvement projects	1
Structural vs. non-structural	1
Contractor Responses	
Simple projects (complex is too much of a challenge)	1
Projects with known production rates and limited unknowns (e.g., milling and resurfacing)	1
Rural projects without long lead time items	1
All are good	1
None	1
Inspector Responses	
Complex, reconstruction	1
Bridge is best	1
In area where critical with impact	1
When there is a milestone to meet	1
Major Roadways	1
Five-mile rural paving jobs	1
Works well with all	1
No answer / Do not think you can use A+B alone anymore	1

Q28. Are there other features of a project (besides type) that would lend itself to work best with A+B?

Besides type, Designers thought location and size (larger being better) are other features that lend themselves to work best with A+B. Contractors thought simple projects and those that meet public need or special events/concerns lend themselves to A+B. Inspectors thought larger projects (such as Designers) and those with seasonal traffic flow increase work best with A+B.

Table E-45: Responses to A+B Working Best with Specific Features

Designer Responses	Times Noted
Location (downtown vs. rural)	1
Larger projects are more beneficial	1
Contractor Responses	
Simple, non-complex project	1
Public need or special events	1
Avoid the rainy season in your earthwork	1
Depends who is bidding	1
All are good	1
Inspector Responses	
Big projects are best	1
Seasonal increases in traffic flow	1
Claim reduction	1
Don’t think so -- in long run (they won't low-ball it)	1
None / No	2

Q29. What is the determining factor on when to use a specific contracting method?

Designers felt factors such as location, complexity, road utilization, scope definition, and budget flexibility all are vital in contracting method selection. Contractors felt time frame was the main determining factor on when to use a specific method. Inspectors felt public impact, time frame, complexity/size, and whether preliminary studies were conducted were the main determining factors.

Table E-46: Responses to A+B Determining Factors

Designer Responses	Times Noted
Location	1
Complexity	1
Utilization of the road	1
Well defined scope (e.g., milling and resurfacing jobs that do not have a lot of extra parts)	1
Budget flexibility	1
Contractor Responses	
Time frame – duration, from design to implementation / Anything that will shorten the project and get the road cleared faster is good	1
Depends who is bidding	1
This is an Owner question	1
Inspector Responses	
Impact on the public	2
Complexity and size of project	1
Time frame / How fast department wants to do it	1

How much preliminary studies/permitting will be needed	1
Type of work	1

Q30. Do all participating parties (owners/designers/contractors) work well under A+B?

Designers were split as to whether all participating parties worked well with A+B. The majority of Contractors said the parties do not work well together with A+B. However, the majority of Inspectors said the parties do work well together.

Table E-47: Responses to A+B Party Cooperation

Designer Responses	Times Noted
Yes	1
No	1
Contractor Responses	
Yes	1
No	3
Poisonous environment	1
CEI not vested in A+B … not incentivized	1
Inspector Responses	
Yes	7
No	1

Q31. Is there one party that stands out as having the most conflict/difficulty with the method? And how so?

One Designer said Contractors stand out as having conflict – they struggle to obtain bonuses. Contractors said Owner/FDOT have the most difficulty because they do not buy-in to the reduced contract time (and often use the "time" as a hammer). Inspectors said Contractors (as too claims-conscious and standing to lose the most) and CEIs (getting in the way) have the most difficulty.

Table E-48: Responses to A+B Party Conflict

Designer Responses	Times Noted
Contractors -- struggles to get bonuses	1
Contractor Responses	
Owner/FDOT – doesn't buy in to reduced contract time (e.g., approval times for submittals are not reduced) / they use the "B" component (time) as a hammer	2
Contractors – too many are crooked	1
CEI – testing proceeds at usual speed – no incentive for them to increase speed	1
Inspector Responses	
Contractor – they stand to lose the most / can be too claims-conscious	3
CEIs – get in the way	2
Owners – overly restrictive	1
Designers – have shortened schedule / more burden on EOR for review	1
Varies from project-to-project	1
Not in my experience	1
Do not know	1
None	1

Q32a. Is FDOT District ___ handling A+B differently than other DOTs/districts/agencies?

[Given the nature of this question, and the variability of responses, a proper analysis of this question cannot be made as it depends on the breadth of experience of the individual respondent. As such, and for the benefit of the district offices, the responses for this question are solely presented for review.]

Table E-49: Responses to A+B District Handling

[District 1]	Respondent	Times Noted
No difference	Designer	1
More than likely; they use it A+B with I/D	Inspector	1
[District 3]	**Respondent**	**Times Noted**
Same	Inspector	1
[District 4]	**Respondent**	**Times Noted**
Not that I'm aware of	Designer	1
D4 used to	Inspector	1
Think they're not now -- not mixing it with other methods (i.e., train)	Inspector	1
[District 5]	**Respondent**	**Times Noted**
A-13 forbids using A+B alone	Inspector	1
No	Inspector	1
[District 6]	**Respondent**	**Times Noted**
All same, as far as I know	Designer	1
Don't see any others	Contractor	1
No. If anything, more forgiving and allow extensions / more willing to bend on time to avoid claims	Inspector	1
Don't think so	Inspector	1
Nothing	Inspector	1
[District 8]	**Respondent**	**Times Noted**
Turnpike – has a greater sense of urgency than other districts	Contractor	1

Q32b. Is their method of handling A+B better or worse than other DOTs/districts/agencies?

[Given the nature of this question, and the variability of responses, a proper analysis of this question cannot be made as it depends on the breadth of experience of the individual respondent. As such, and for the benefit of the district offices, the responses for this question are solely presented for review.]

Table E-50: Responses to A+B District Handling Differences

[District 1]	Respondent	Times Noted
It's the same	Designer	1
[District 4]	**Respondent**	**Times Noted**
Can't say	Inspector	1
[District 5]	**Respondent**	**Times Noted**
N/A, haven't done A+B outside of D5	Contractor	1
The same	Inspector	1
[District 6]	**Respondent**	**Times Noted**
All same, as far as I know	Designer	1
No	Inspector	1

A+B Bidding: FDOT Task Order List of Questions:

a. Regarding special provisions that are specific to project contracting methods … are there any specific items in the special provisions that are ambiguous and/or can be improved upon?

Table E-51: Responses to A+B Special Provisions

Designer Responses
Yes
No
Contractor Responses
Not that I can think of
Don't know
Time extension requests
No opinion
Inspector Responses
No ambiguity
Yes --> with NEB, now an excuse with NEB / they need to mean it
Can't think of anything right now

b. Did the contracting method have an impact/effect on the QC/QA process? / Did something in the contracting method alter the QC/QA process?

Table E-52: Responses to A+B QC/QA

Designer Responses
Yes
It doesn't require something different, but it does put more pressure on finishing the project quicker.
Contractor Responses
Yes. See last page - CEI example [Q.34 -- CEI. Testing samples are taken and processed at usual speed. No incentive for them to increase speed.]
No
No opinion – same work, same specs
Inspector Responses
No
Don't think so / (DB more work for CEI) --> a lot of paperwork / document time impacts changes focus
Not an adverse effect, QC didn't suffer

c. Are the contracting methods typically appropriate for the project types? / For projects with bonuses/incentives, are the values set at an appropriate level (i.e., do the values properly reflect daily road-user costs)?

Table E-53: Responses to A+B Appropriate Selection

Designer Responses
Yes, typically
Yes / Yes
Contractor Responses
Yes, but should do more
Yes

No the incentive is not large enough. Most times the incentive is not large enough to warrant additional costs spent to gain a day.
When in a hurry, they use A+B
Inspector Responses
Yes / Yes
Think so / level appropriate --> application of award is not always consistent

d. Do you believe the maximum time set by the department during project advertising is reasonable/reasonably aggressive? Could the job reasonably be built within that timeframe?

Table E-54: Responses to A+B Maximum Time

Designer Responses
Yes / Definitely, yes
Yes. They do a pretty good job.
Depends on the project – sometimes / Where they become unreasonable is when there's an addendum added before due (i.e., in D7 added a week before due – unfair to get it done in the amount of time.) Also, no consideration for holidays – don't think DOT makes any consideration. (i.e., with November, December)
Contractor Responses
Yes / Yes
No. Sometimes FDOT pulls the time out of the air
Varies from job to job
Minimum time is not reasonable – from my experience … too many other restrictions (i.e., can't drill piles at night, can't get aggregate because pits are closed at night) – not everything can be automatically double shifted … premium with working at night and/or stockpiling on items – because getting materials to site at night is not the same as day
Inspector Responses
Department has generally been generous with time they provide. / That is done by the designer. / [e.g., designers based time on production, such as working at night with restrictive hours -- change of times to more reasonable range made project doable]
They're good (most rushing by contractor is not due to advantage).
Was reasonable

e. Regarding how the FDOT distributes projects by contracting method … are they picking the right projects for their program (i.e., are there enough DB vs. LS projects)? How can they do better?

Table E-55: Responses to A+B Distribution

Designer Responses
Yes
It seems reasonable. The bigger and more complicated jobs are toward a little bit more exotic methods. The straightforward are toward lump sum. I think they are doing a pretty good job on the distribution.
Contractor Responses
Too many factors to determine. LS is ideal for rural resurfacing projects
Haven't seen A+B as of late
Inspector Responses
Would say so, yes. DOT using DB for largest and more complex projects -- gives Designers opportunity to be more creative / have greater control. Contractor has ability to move forward.
Yes. Most DB are large, complex, standard project are more standard or incentives
(Not sure I can answer that)

<u>A+B Bidding: Refuted Literature</u>:

- **A+B is best suited for bridge projects**

Table E-56: Responses to A+B Refuted Literature

Designer Responses
(none)
Contractor Responses
Disagree. Foundation unknowns prevent accurate scheduling.
Don't' think that is a true statement – if you can't accelerate it at night … things are riskier at night -- you can say our district does bridges
Inspector Responses
Agree -- not good, bonus or incentive / if big, maybe DB
Would agree -- too many pitfalls in bridge construction / Not appropriate here in S. FL -- no new bridges, just expanding old ones

<u>A+B Bidding: Conflicting Issues</u>:

- **64% of designers believe A+B results in significant savings, while 75% of contractors <u>do not</u> believe so**

Table E-57: Responses to A+B Conflicting Issue #1

Designer Responses
Side with the contractors – that's a lack of understanding of what the savings really is whatever contractor saves in making the contract shorter he puts back into it
Contractor Responses
I agree with contractors
Agree with contractors – don't' think A+B is savings of cost, but acceleration of time – and there's a premium
Inspector Responses
Agree with contractors -- use time to win the job
Contractor had to put more into effort to get bonus

- **79% of designers believe A+B is more influenced by weather, while 52% of inspectors <u>do not</u> believe so**

Table E-58: Responses to A+B Conflicting Issue #2

Designer Responses
(don't know the answer to that)
Contractor Responses
I agree with designers
Agree with designers – once you put down what your B component is, you are stuck with it … weather is much more ___ but FDOT is more equitable with other agencies or DOTs with how they administer weather – may be equitable on time but not on dispensation of costs
Inspector Responses
Inspectors don't know

Don't think it has impact so long as weather specifications applied correctly

- **63% of designers believe A+B has wide agency support, while 60% of contractors <u>do not</u> believe so**

Table E-59: Responses to A+B Conflicting Issue #3

Designer Responses
(has had the one consultant that refused to work with A+B)
Contractor Responses
I agree with contractors
Don't know – can't speak for DFOT – if you put out A+B let them know urgency … competitors are overly optimistic – need all the help we can get
Inspector Responses
Maybe because Designers aren't involved in construction
(No statistical difference.) I'd go with contractors

No Excuse Bonus

Q33. Do you prefer a single large bonus or graduated smaller bonuses?

Designers prefer graduated, smaller bonuses for NEB, stating it's more attractive and it works to the owner's benefit (and citing that with larger bonuses, contractors may focus all their resources on that one portion, neglecting the remaining portions). The majority of Contractors preferred graduated, smaller bonuses, favoring the ability to earn some reward for their efforts rather than none at all. Inspectors had a closer split, but also favored graduated, smaller bonuses citing that milestone bonuses work best for larger jobs.

[The table below includes "overall statements" made by a few interview participants. These individual responses were provided in lieu of answering the entire section of questions, and are usually due to participants not having sufficient experience but still possessing a general opinion on the matter.]

Table E-60: Responses to NEB Bonus Preference

Designer Responses	**Times Noted**
Graduated, smaller	2
(Graduated:) works to owner's benefit / with one large bonus, they can put all their resources on that part and disregard other parts / more attractive	2
No bonus	1
No preference	1
[overall statement for this section:] Not a contractor, so don't use it	*2*
[overall statement for this section:] No experience / this is more contractor-related	*1*
Contractor Responses	
Graduated, smaller	3
Single, large	1
(Single:) do-or-die	1
(Graduated:) rewards Contractor for effort	1
(Graduated:) ability to earn some rather than none	1
Inspector Responses	
Graduated, smaller	3
Single, large	2
(Single:) best for a smaller job	1
(Single:) contractors are more likely to pursue	1
(Graduated:) milestones best for a larger job	2
Prefer graduated smaller with one bonus at the end	1
Prefer single big bonus for completion of a significant milestone	1
Neither	1
[overall statement for this section:] With NEB and I/D, contractors feel obliged to get the bonus money … or they seek out claims	*1*
[overall statement for this section:] Decision to use NEB does not have to be made very early. Suggest the option to use NEB for a job to a very last day, before the letting day. Decision could be made later in stages. Currently, it has to be done many years in advance to get to the money program. / Should be used more frequently	*2*

Q34. In your opinion, do you like No Excuse Bonus?

Designers, Contractors, and Inspectors all like NEB. Designers and Inspectors note there always being excuses, and the key to using NEB is picking the right project. Contractors made mention of there being no provision for unforeseen issues or utilities.

Table E-61: Responses to Liking NEB

Designer Responses	Times Noted
Yes	3
There are always excuses	2
Key is to match project type with contracting method – NEB attractive if having to meet significant milestones by certain deadlines	1
Contractor Responses	
Yes	2
No – no provision for unforeseen or utilities	1
Inspector Responses	
Yes	5
No	2
Works for the right projects	1
There are always excuses	1

Q35. What is the best feature of No Excuse Bonus?

The one Designer respondent said the best feature of NEB was the extra money (bonus) for extra effort (speedy delivery on the part of the contractor). Contractors felt the best feature of NEB was the incentive itself and all the project participants' appreciation of the deadline. Inspectors felt the faster completion of the projects and the "no excuses" were the best features.

Table E-62: Responses to NEB Best Feature

Designer Responses	Times Noted
Extra money for extra effort	1
Contractor Responses	
Project participants appreciate the seriousness of the bonus deadline – even if they don't benefit from it directly	1
Incentive	1
Doesn't have one	1
Inspector Responses	
Faster completion of projects / Speeds up construction project / Job gets done by the deadline	3
No excuses	2
Good contractor can typically finish early	1
Avoid claim and forces issue resolution	1
Contractor seems to push project forward without constant push from CCEI management	1

Q36. What is the worst feature of No Excuse Bonus?

Designers note the worst features of NEB is it sometimes being impossible to achieve, and a lot of overtime being spent in the process. Contractors note the FDOT's aggressive stance with time frames, and when they go after the bonus they often exhaust their resources to do so – or they will claim it as a fee. Inspectors note how contractors, when seeing they will not meet the bonus deadline, pull back their resources, and how contractors that do not meet their deadline still often get the bonus.

Table E-63: Responses to NEB Worst Feature

Designer Responses	Times Noted
Sometimes not possible to achieve / can spend a lot of overtime	1
Find excuses -- tighten reins	1
Contractor Responses	
FDOT frequently too aggressive with time frames	1
Contractors use it as fee, or if you try to earn it "you spend it to get it"	1
Weather	1
Inspector Responses	
Contractors, when seeing they won't make the incentive, pull back their resources	2
Not used to potential – contractor not meeting date but still getting bonus	1
Contractor finds excuses and tends to not want to do extra work	1
Restrictive	1
No bad feature	1

Q37. Would you consider No Excuse Bonus a successful contracting method, as currently being used by FDOT?

Designers were split as to whether NEB is successful, as currently used by the FDOT. The small majority of Contractors think NEB is successful. And the majority of Inspectors think NEB is successful; however, they note this being the case only half of the time, as long as the right projects are being selected as NEB, and that even still the NEB projects are only about 20% faster than non-NEB projects.

Table E-64: Responses to NEB Success

Designer Responses	Times Noted
Yes – needs to be more of it / not used enough	1
No	1
Not sure	1
Contractor Responses	
Yes	2
No	1
Inspector Responses	
Yes	6
No	2
Only successful 50% of the time	1
As long as the right project is picked	1
Successful only in fact that projects with NEB are maybe 20% faster than those without them	1

Q38a. Is Florida using No Excuse Bonus to its greatest potential?

The majority of Designers, Contractors, and Inspectors all think Florida is not using NEB to its fullest.

Table E-65: Responses to NEB Potential

Designer Responses	Times Noted
No	1
Room for improvement	1

Not sure	1
Contractor Responses	
No	2
Don't like it	1
Inspector Responses	
Yes	1
No	4
I'd like to see it on more projects -- especially urban jobs with a lot of signal work	1
I do not know	1

Q38b. If not, how is it being underutilized?

Designer respondents feel NEB is being underutilized by not having more, and larger, bonuses. Contractors feel NEB should be used more frequently, and have more liberal deadlines. Inspectors also feel NEB should be used more frequently, but also note it is not being picked appropriately by those projects that would really benefit from early finish dates.

Table E-66: Responses to NEB Underutilization

Designer Responses	Times Noted
They should not be used	1
Could be more bonuses and larger	1
Contractor Responses	
Should be used more frequently with more liberal deadlines	1
Some projects have deadlines for local events yet no bonus for meeting the date	1
Inspector Responses	
Not used enough	1
Not picking the right projects – used more on political/visual/public projects rather than those that would better benefit by being finished early	1
Cultural change over the years: (since the economic downturn) projects had no bonuses, so they filed claims … (now, in better times) bonuses are offered, but claims are still being sought after / thought process on FDOT's part is to close the claim to get it off the books – therefore, bonus money used to pay claims – and appearance that "NEB" does not mean "NEB"	1

Q39. What can FDOT do with the implementation of No Excuse Bonus to improve its use?

Designers, Contractors, and Inspectors all suggest the NEB bonuses should be broken up into graduated amounts, or specific milestones. Designers also think excuses should not be permitted. Contractors and Inspectors further suggest it should be used more often, and the department should be more flexible.

Table E-67: Responses to NEB Implementation

Designer Responses	Times Noted
Shouldn't be any excuses	1
Tie it to specific milestones (e.g., meet it by certain date) / beneficial if broken up / Can be smaller bonuses, if all tied into a specific process	2
Contractor Responses	
Use more widely	1
Use graduated amounts	1
Be more flexible – have a reasonable approach / "notwithstanding clause"	1
Inspector Responses	

Use it more often	2
Include it on more projects for milestones	1
Set realistic, achievable deadlines	1
Be more flexible (default statement to say to stick with no bonus – but not that easy)	1

Q40. To benefit from the advantages of No Excuse Bonus, what does the FDOT need to do?

To benefit from its benefits, Designers believe the FDOT should not accept excuses, select the right kinds of project for NEB, and shorten the time durations. Contractors believe the FDOT should reward the CEI and EOR for cooperation. Inspectors believe the FDOT should use reasonable production rates to establish the bonus time (and inform the contractor how this is calculated so everyone is presumably on the same page); and they also feel, as the Designers, they should not accept excuses, and select the right kinds of projects for NEB. Of note, Inspectors further think the FDOT should use NEB more often, have bonuses large enough to be worthwhile, and to have a proactive mentality – accept the money as a valid expense to obtaining the time-savings benefit, and not looking to get out of spending the money.

Table E-68: Responses to NEB Advantage Benefits

Designer Responses	**Times Noted**
Accept no excuses	2
Select right kind project / Understand what they're paying for -- why is it important to get it early / Bonuses great for emergency -- big cost, big risk, big reward	1
Shorten the time durations	1
Contractor Responses	
Reward CEI and EOR for cooperation	1
Inspector Responses	
Use reasonable production rates to establish the times for the bonus / Inform contractor how bonus time is calculated (i.e., based on 5-day vs. 6-day work week)	2
Accept no excuses	1
Select right kind of project	1
Use it more	1
Establish large enough bonus to make it worthwhile	1
Consider the bonus money as “spent money” – you spend the money in order to get the benefit, don’t think how do we get out of spending the money	1
Continue to measure it and work with FTBA	1

Q41. What are your greatest concerns regarding No Excuse Bonus?

Designers’ concerns were the department’s commitment to the method – specifically with still permitting “excuses”. Contractors comment on the effort being given and the deadlines not being met (implying unrealistic dates). Inspectors are concerned with when contractors realize they cannot meet a deadline and subsequently pulling back their resources (implying, perhaps the need for more “worthwhile” bonuses); the outside impacts that influence NEB; addressing the public’s perception on why the department is spending extra money (the reasoning here is that the public assumes the project’s costs should be just that – the extra bonus seems “sketchy”); fear of the department possibly making bonuses too large; and when battling contractors for claims, to not be afraid to pull the bonus.

Table E-69: Responses to NEB Concerns

Designer Responses	Times Noted
They still have excuses / Department doesn't commit	2
No advantage to the project / Don't think it saves time	1
Contractor Responses	
Effort given and date not achieved	1
Inspector Responses	
Contractor realizes he won't make it and pulls back / When the contractors see they cannot get bonus, they stop the efforts	2
Outside impacts are especially magnified on a NEB job	1
Making bonuses too big	1
Perception by others, public, etc. on why we are giving extra money	1
If battling contractor for claims, don't be afraid to pull the bonus	1

Q42. When is No Excuse Bonus a disadvantage?

Designers felt it was a disadvantage when NEB was NOT used on high-impact job (perhaps a misinterpretation of the question, but a notable comment). Contractors felt NEB was a disadvantage when it was too aggressive. Inspectors felt NEB was a disadvantage when permitting/ROW/utility work is not coordinated up-front – as this aligns with their comments on a lack of flexibility in adding additional work.

Table E-70: Responses to NEB Disadvantage

Designer Responses	Times Noted
Advantage on high-impact jobs	1
Delivery benefits of NEB are never a disadvantage	1
Contractor Responses	
When it is too aggressive	1
Inspector Responses	
When there hasn't been enough up-front work to coordinate the permitting/ROW/utilities	1
No flexibility to add additional work (can be an issue for unforeseen conditions)	1
If the contractor can cut corners, we lose quality	1
When predicting the project completion time is hard	1
Don't ever see it as a disadvantage	1
Don't really know	2

Q43. What types of projects do you feel works best with No Excuse Bonus?

Designers felt the best jobs for NEB include: high visibility projects; public safety projects; and jobs with significant traffic impact (i.e., hard deadlines). Contractors felt the best jobs for NEB include those with community-set deadlines. Inspectors felt NEB works best with large, complex, time-sensitive projects in urban setting; interstate jobs; bridges; milestone projects; issue-dense jobs; and high profile projects.

Table E-71: Responses to NEB Best Type Projects

Designer Responses	Times Noted
High visibility type jobs	1
Public safety / revenue issue	1
Jobs with significant traffic impact. Jobs with a hard deadline.	1
Contractor Responses	

Jobs with community deadlines	1
Inspector Responses	
Complex, urban, large, time-sensitive	1
Bridges best -- less weather impact	1
Interstate projects	1
Projects with a lot of issues – allows contractors to work towards issue resolution	1
Milestone projects	1
Highly politically charged / high profile / densely populated / any other large project should use incentive	1

Q44. Are there other features of a project (besides type) that would lend itself to work best with No Excuse Bonus?

Besides type, Designers felt location and project cost determine if a project worked best as NEB. Contractors felt highway safety would determine if a project worked best as NEB. Inspectors said the features to best determine if a project lent itself to NEB included: milestones; cost-impact on local businesses; as well as size, complexity, time-sensitivity, location (urban vs. rural).

Table E-72: Responses to NEB Working Best with Specific Features

Designer Responses	Times Noted
Location	1
Higher priced ones	1
Not that I can think of / Not sure	2
Contractor Responses	
Vehicle accident history / unsafe highways	1
Inspector Responses	
Projects with required milestones (i.e., interstate ramps)	2
Cost impact of traffic on the local business – want to reduce those impacts	1
Complex, urban, large, time-sensitive	1
Best if project is not complex	1
Do not know	1

Q45. What is the determining factor on when to use a specific contracting method?

Designers felt the determining factor on when to use a specific contracting method was scope. (To note, one respondent commented on the client making this decision and not something they, as the designer, would determine.) The one Inspector respondent noted public need as determining specific contracting method. Inspectors noted public impact, as well as the level of preliminary study/permitting needed.

Table E-73: Responses to NEB Determining Factors

Designer Responses	Times Noted
Scope	1
Client makes decision	1
Contractor Responses	
Public need	1
Inspector Responses	
Impact on the public	1
How much preliminary studies/permitting will be needed	1
Don't know how they determine it	1

Q46. Do all participating parties (owners/designers/contractors) work well under No Excuse Bonus?

All Designer and Inspector respondents believed participating parties worked well under NEB – with Designers noting it hinged on the contractors not making excuses for change orders, and Inspectors noting it hinged on the owner not wanting to refuse to pay out bonuses. Contractors were split.

Table E-74: Responses to NEB Party Cooperation

Designer Responses	Times Noted
Everyone works well	3
All work well when the contractor is not making excuses to get change orders	1
Contractor Responses	
Yes	1
No	1
Noticeable increase in cooperation levels, even from those who do not benefit directly	1
Inspector Responses	
Yes	7
Owner is key – sometimes you get an FDOT guy that just doesn't want to pay the bonus	1

Q47. Is there one party that stands out as having the most conflict/difficulty with the method? And how so?

The majority of Designers did not think any one party stood out as having issue with NEB, although one did comment on the FDOT having the most difficulty (contrary to the responses in the previous question where all Designers said everyone worked well – which may have been an afterthought). Contractors commented on how they (contractors) are the only ones fully vested in the method. And the majority of Inspectors mirrored this belief, stating contractors are the only ones looking to profit from the bonus. Inspectors also noted how owners (who do not want to pay bonuses), designers, and utility contractors (who have no incentive to expediting the work) stand out as having the most conflict.

Table E-75: Responses to NEB Party Conflict

Designer Responses	Times Noted
FDOT	1
No / Don't think so / Not to my knowledge	3
Contractor Responses	
Only contractor has a vested interest	1
Inspector Responses	
Contractors – they're the only ones that achieve it	3
Owner – owner may not want to pay out bonuses	1
Designers	1
Outside party like utility contractor because they have no bonding to the contract. They have no incentive to do that. It does not matter for them to expedite their work.	1

Q48a. Is FDOT District ___ handling No Excuse Bonus differently than other DOTs/districts/agencies?

[Given the nature of this question, and the variability of responses, a proper analysis of this question cannot be made as it depends on the breadth of experience of the individual respondent. As such, and for the benefit of the district offices, the responses for this question are solely presented for review.]

Table E-76: Responses to NEB District Handling

[District 3]	Respondent	Times Noted
No	Inspector	1
Same	Inspector	1
[District 4]	**Respondent**	**Times Noted**
No, not that we've seen	Designer	1
Not sure	Designer	1
Can't say	Inspector	1
[District 5]	**Respondent**	**Times Noted**
Do not know	Inspector	1
No answer	Inspector	1
No	Inspector	1

Q48b. Is their method of handling No Excuse Bonus better or worse than other DOTs/districts/agencies?

[Given the nature of this question, and the variability of responses, a proper analysis of this question cannot be made as it depends on the breadth of experience of the individual respondent. As such, and for the benefit of the district offices, the responses for this question are solely presented for review.]

Table E-77: Responses to NEB District Handling Differences

[District 3]	Respondent	Times Noted
About the same	Inspector	1
[District 4]	**Respondent**	**Times Noted**
Not sure	Designer	1
[District 5]	**Respondent**	**Times Noted**
Turnpike used to use them extremely frequently and we feel it was a successful program. Utilization has dropped off and we do not know why.	Contractor	1
The same	Inspector	1
[District 6]	**Respondent**	**Times Noted**
Not handling it any differently / Can't recall cities that are using NEB	Designer	1

<u>No Excuse Bonus: FDOT Task Order List of Issues</u>:

a. Regarding special provisions that are specific to project contracting methods … are there any specific items in the special provisions that are ambiguous and/or can be improved upon?

Table E-78: Responses to NEB Special Provisions

Designer Responses
A lot of ambiguous items, and can be improved upon (but can't say specifics)
Hard to say -- project-specific
The clear and unambiguous is the key. Whenever there is the cloudiness, that’s where the problem develops. To answer your question, I think as long as the law is clear, it should be fine.
Not sure
Contractor Responses
[same as DB] Time extension requests
Inspector Responses

(NEB and I/D work the same / tied in with A+B)
No comments on the specifications

b. Did the contracting method have an impact/effect on the QC/QA process? / Did something in the contracting method alter the QC/QA process?

Table E-79: Responses to NEB QC/QA

Designer Responses
All these methods have impacts (time vs. quality) / Inspectors a little less demanding
No / No -- with warranties, still going to procure
It’s similar, but more so.
No
Contractor Responses
[same as DB] No
Maybe – if feeling rushed, QC/QA compromised
Inspector Responses
No, no impact

c. Are the contracting methods typically appropriate for the project types? / For projects with bonuses/incentives, are the values set at an appropriate level (i.e., do the values properly reflect daily road-user costs)?

Table E-80: Responses to NEB Appropriate Selection

Designer Responses
Yes / Think so
Think so / Most cases, numbers are higher than they need to be / If safety, should be high, else low
Not sure
Contractor Responses
[same as DB] No the incentive is not large enough. Most times the incentive is not large enough to warrant additional costs spent to gain a day.
Inspector Responses
Yes / Values set appropriately

d. Are the bonuses/incentives worth it (to the contractor) to increase construction efforts to complete the project early/on time? If not, what should the values be?

Table E-81: Responses to NEB Bonuses

Designer Responses
Of course -- Yes -- never seen one that isn't
Yes, absolutely
Not sure
Contractor Responses
[same as DB] Varies from job to job
No
Inspector Responses
Usually yes. Needs to be enough to justify overtime to meet deadline.
Do not know

e. **Regarding how the FDOT distributes projects by contracting method … are they picking the right projects for their program (i.e., are there enough DB vs. LS projects)? How can they do better?**

Table E-82: Responses to NEB Distribution

Designer Responses
Plenty NEB
Need to continue to keep DB at 50% of program
Not sure
Contractor Responses
[same as DB] Too many factors to determine. LS is idea for rural resurfacing projects
NEB is pretty rare but us9ually on large complex jobs, so hard to say in black and white
Inspector Responses
Based on bonuses, more projects can be bonuses. / Don't need to limit them to just big projects

No Excuse Bonus: Refuted Literature:

- **NEB contractors typically share bonuses with subcontractors to motivate their cooperation**

Table E-83: Responses to NEB Refuted Literature

Designer Responses
Sharing it with people they need to / Cutting out people not in critical path
I do not know
Contractor Responses
Experience is that is not a general practice
Inspector Responses
Don’t think they do, no

No Excuse Bonus: Conflicting Issues:

- **91% of inspectors and 75% of designers do not believe contractors typically share bonuses with subcontractors to motivate their cooperation, while 50% of contractors believe they do**

Table E-84: Responses to NEB Conflicting Issue #1

Designer Responses
Not a lot of NEB on DB (surprised with 75% of designers, because they see it on contract and want to participate) / Inspectors don't know
I do not know what the statistics are.
Contractor Responses
Contractors shouldn’t share bonuses with subcontractors. It is not a bribe, it is a lump sum payment that fixes the completion date in time, overriding the incentive to drag the project out for other reasons.
This statement clearly shows that CEI and EOR (and probably the Department) have very little understanding of Contractor ethics and the cooperation/comradery in the industry. It is a sad commentary on Owner perspective.
Agree with inspectors and designers on that one
Inspector Responses
Don't think they do

Incentive/Disincentive

Q49. Does I/D work well as a stand-alone method?

All Designer and Contractor respondents felt I/D works well as a stand-alone method – with one Designer noting it works well for well-defined projects, and one Contractor noting it is liked but not that effective. The vast majority of Inspectors also felt I/D works well, and among their comments were: it should be used more often; it should be used for all types of projects; they like it in conjunction with NEB; and that it works better than NEB. (Of note, and as also noted of NEB, the FDOT is seen as "pushing claims away" in that contractors feel obligated to the bonus money, and will seek it through claims if not awarded the bonus, and in response the FDOT will pay out the claims in order to close out the project.)

[The table below includes "overall statements" made by a few interview participants. These individual responses were provided in lieu of answering the entire section of questions, and are usually due to participants not having sufficient experience but still possessing a general opinion on the matter.]

Table E-85: Responses to I/D Stand-Alone

Designer Responses	Times Noted
Yes	2
Works well for things that are well defined	1
[overall statement for this section:] Not a contractor, so don't use that	*2*
[overall statement for this section:] No experience -- more contractor related	*1*
Contractor Responses	
Yes	6
It's a good system overall	1
Well liked, but really not that effective	1
Inspector Responses	
Yes	8
No	1
Should be used more often	2
Should be used for all types of projects	2
Like I/D mixing with NEB	2
Better than No Excuse Bonus	2
Never seen department use it stand alone, but think they do work well	1
Used to push claims away – contractors feel obliged to get the bonus money … so if they don't meet the deadline they file claims … and FDOTs are quick to settle	1

Q50. In your opinion, do you like I/D?

The one Designer respondent likes I/D. And the majority of the Contractors and Inspectors also like I/D – with the Inspectors noting the department gets no benefit from it, and that it is only liked when used on appropriate projects.

Table E-86: Responses to Liking I/D

Designer Responses	Times Noted
Yes	1
Contractor Responses	
Yes	4
No	1

Inspector Responses	
Yes	4
No – not used to meet the intent / Department gets no benefit to using it	1
Like it if appropriate to the project	1

Q51. What is the best feature of I/D?

Designers thought the best feature of I/D was that it motivates the contractor and that there are both awards and penalties. The majority of Contractors and Inspectors both thought I/D motivates the contractor to work faster and finish early by means of rewards and penalties. Contractors also thought I/D allows contractors to incentivize employees and subcontractors; forces thoughtfulness and planning; and always provides the possibility of some reward. Inspectors further noted I/D is beneficial to both the contractor in achieving bonuses, and to the public for less impact and early accessibility to the completed project.

Table E-87: Responses to I/D Best Feature

Designer Responses	Times Noted
Really does motivate the contractor	1
There are both penalty and rewards	1
Contractor Responses	
Incentive to work faster / motivation to finish the job early	2
Gives contractor a chance to make more money / Gives contractor the chance to incentivize employee and subcontractor performance	1
Forces thoughtfulness and planning	1
Always a possibility of some reward	1
Inspector Responses	
Encourages contractor from both directions (reward and benefit) / Disincentive that contractor is penalized for not meeting delivery deadline / Give contractor incentive to work towards deadline	6
Win-win – bonus to contractor and beneficial to public	1
Less public impact – and contractor gets paid for that	1

Q52. What is the worst feature of I/D?

The one Designer respondent noted the worst feature of I/D is that it may incentivize cutting corners. Contractors and Inspectors both note that disincentives outweigh incentives and they should be more balanced; as well as contractors have no control over unforeseen conditions, and the contract is hard to adjust for these issues. Contractors went on to note there are no incentives/disincentives for other parties (i.e., utility contractors). One Inspector respondent, however, made mention that of how easy it is to use unknowns to change the incentive date (which is contradictory to the previous statement that unknowns pose a major disadvantage). (Of further note, one Contractor respondent mentioned how I/D levels the competitive playing field, by not permitting lowball time bids.)

Table E-88: Responses to I/D Worst Feature

Designer Responses	Times Noted
May incentivize them to cut corners	1
Contractor Responses	
Contractor has no control over unforeseen conditions (e.g., weather, utilities, permitting)	2
Disincentive outweighs incentive – should be more balanced	1
No I/D for other parties such as utility contractors	1

Being late, you pay a penalty – can't lowball bid for time like with A+B / Much more equitable approach / levels competitive playing field	1
Inspector Responses	
Incentive needs to be much more than the disincentive / Disapprove of how disincentive time is calculated – consider reducing it	2
Hard to adjust contract for unforeseen conditions – puts you in a claim position	1
Easy to use unknowns to change incentive date	1
Setting the right date appropriately for the right parameters	1
Choosing a wrong type of project	1

Q53. Would you consider I/D a successful contracting method, as currently being used by FDOT?

For the most part, Designers, Contractors, and Inspectors mostly feel I/D is successful as currently being used by the FDOT. Contractors also commented on it not being used on many jobs, and the problems encountered with utility involvement.

Table E-89: Responses to I/D Success

Designer Responses	Times Noted
Yes	1
Not sure	1
Contractor Responses	
Yes	4
Not used on many jobs	1
Some problems when utility is behind	1
Inspector Responses	
Yes	5
No	1

Q54a. Is Florida using I/D to its greatest potential?

Designer respondents were unsure if Florida was using I/D to its greatest potential. The majority of Contractors felt it was not being used to its fullest – noting that it should be used more often and that incentives should be used for all parties involved. All Inspector respondents also felt I/D was not being used to its greatest potential – noting also that it should be used more often, that it helps get the contractor motivated, and that if not for budgetary constraints more bonuses would be set up for more projects.

Table E-90: Responses to I/D Potential

Designer Responses	Times Noted
I don't know / Not sure	2
Contractor Responses	
Yes	1
No	3
Could be used on more projects	1
Provide incentive for all parties involved	1
Inspector Responses	
No	3
Could be used more	2
Gets contractor motivated	1

Budgetary constraints – we would put bonuses for more projects if the money were available	1

Q54b. If not, how is it being underutilized?

Contractors felt I/D is being underutilized by not being used on enough projects. Inspectors also felt it is not always used when it could be, and that it should be used more on urban jobs with MOT shifts.

Table E-91: Responses to I/D Underutilization

Designer Responses	**Times Noted**
(none)	-
Contractor Responses	
Not using it on enough projects	2
Inspector Responses	
Not always used when it could be	1
Should be used more on any urban job with a lot of MOT shifts, etc.	1

Q55. What can FDOT do with the implementation of I/D to improve its use?

Designers had no notable responses to how FDOT can improve the use of I/D. Contractors suggested increasing incentives to make them worthwhile; using it on projects where completion dates are important; provide incentives for other parties (utility contractors, engineers, CEIs, etc.); and allow adjustments for weather, holidays, and added work. Inspectors suggest using I/D more often and using it when appropriate; using milestones to increase I/D effectiveness; and, during design, identify impediments to achieving incentives.

Table E-92: Responses to I/D Implementation

Designer Responses	**Times Noted**
Much of it depends on the project type / Not sure	2
Contractor Responses	
Make sure the incentive is large enough / increase incentives	2
Use it on projects where they need to get the contractor off the road by a certain day	1
Provide incentives for utilities, engineers, and CEI	1
Allow for adjustments based on weather, holidays, and added work	1
Inspector Responses	
Use it more often	1
Consistently use it when it will help	1
Pick milestones that will get the greatest bang for your buck … not just on project completion	1
Better define what can move contract date out	1
During design phase, has to be significant effort in identifying impediments to achieve incentives	1

Q56. To benefit from the advantages of I/D, what does the FDOT need to do?

Contractor respondents suggest the FDOT do the following to benefit from I/D's advantages: ensure incentives are worthwhile (that they cover the cost to the contractor to increase their efforts to achieve the incentive); provide incentives to those that have no motivation to finishing early (i.e., utility contractors, engineers, CEIs); and use it more often. Inspector respondents also suggest the FDOT use I/D more often, and that they make incentives worth the costs of increasing effort. Inspectors also suggest picking the right projects for I/D, investigating potential pitfalls during plan and specification preparation, and setting an appropriate time.

Table E-93: Responses to I/D Advantage Benefits

Designer Responses	Times Noted
(none)	-
Contractor Responses	
Make sure there is enough incentive / Make the incentives well over the cost to the contractor to achieve the incentive	2
Provide incentives for utilities, engineers, and CEI / Encourage CEI and District staff to be part of the solution	2
Use it more	1
Inspector Responses	
Use it more	2
Make incentive worth the cost of increasing effort	1
Pick the right projects to use it on	1
Investigate potential pitfalls while preparing plans and specifications	1
Setting appropriate time	1

Q57. What are your greatest concerns regarding I/D?

Designers' greatest concerns regarding I/D are contractors cutting corners. Contractors' greatest concerns were unforeseeable delays and uncontrollable issues, as well as the FDOT not giving a reasonable amount of time to earn the incentive. Additionally, they voice an imbalance between incentives and disincentives. Inspectors' greatest concerns also involved the appropriate setting of time for the initiative, and the general ease of moving the incentive and disincentive dates; as well as it not being used enough, the potential for litigation, and not selecting the right project or contractor for I/D jobs.

Table E-94: Responses to I/D Concerns

Designer Responses	Times Noted
Cutting corners	1
None	1
Contractor Responses	
Unforeseeable delays / uncontrollable issues that impinge on working faster	3
FDOT does not give reasonable amount of time to get the incentive / Initial time before Incentive kicks in	2
Incentives and disincentives are not balanced	1
Inspector Responses	
Ease of moving Incentive and disincentive dates / Setting appropriate time	2
Not used enough	1
Selection of the right project and right contractor	1
Potential for litigation	1
Don't have any	1

Q58. When is I/D a disadvantage?

Designers, Contractors, and Inspectors all feel I/D is a disadvantage when time determined is unrealistic, unreasonable, or calculated wrong. Contractors, furthermore, think I/D is a disadvantage in urban areas with congestion, and when a large portion of the work is subcontracted out (because there is little control of the work when subs are not incentivized). Inspectors further thought I/D is a disadvantage when used on small, simple projects; when there is a major unforeseen construction problem; and when incentives are assumed to be part of a contract.

Table E-95: Responses to I/D Disadvantage

Designer Responses	**Times Noted**
Time determined is unrealistic	1
Not sure there is a disadvantage	1
Contractor Responses	
Amount of time is unreasonable / Where there is no way to get the incentive	1
Urban areas with congestion	1
When large subcontractors used for work (works better with one self-performing entity)	
Doesn't work well with large subcontractor for the work – works better if one entity self-performing … if you give it away to sub you don't have as much control of the work	1
Never	1
Inspector Responses	
When time is not calculated correctly (e.g., too much time given, or day value not proper for the task) / When time is set wrong, the contractor knows he will get a disincentive	2
When used on a small, simple project	1
Incentive assumed to be part of contract	1
When you have significant major unforeseen problems with construction	1
Selection of the right project and right contractor	1

Q59. What types of projects do you feel works best with I/D?

Designers feel the best types of projects for I/D are bridge replacements. Contractors feel the best projects for I/D include those that are time-sensitive; large earthwork; large interstate resurfacing; non-bridge highway; projects with no utilities; and those with a public need. Inspectors also feel time-sensitive jobs, bridges, projects with milestones, high traffic areas, and rural projects work best with I/D.

Table E-96: Responses to I/D Best Type Projects

Designer Responses	**Times Noted**
Bridge replacement (usually want to get those done quickly)	1
Any	1
Contractor Responses	
When time and speed of importance	1
Large earthwork projects	1
Large interstate resurfacing projects	1
Highway – non-bridge	1
Resurfacing	1
Bridge	1
Project without utility	1
Jobs with public need	1
Type does not matter	1
Inspector Responses	
Ones that are time sensitive	2
Bridge or road	1
Projects with inter-milestones	2
High traffic areas	1

Rural projects / Bridge projects	1

Q60. Are there other features of a project (besides type) that would lend itself to work best with I/D?

Contractors felt other features that lent themselves to working with I/D were if the project had a massive impact on the traveling public. (Among the contractors' other responses were specific types that were previously mentioned in the previous question.) Inspectors felt the other features that lent themselves to working with I/D were complexity and phases.

Table E-97: Responses to I/D Working Best with Specific Features

Designer Responses	Times Noted
(none)	-
Contractor Responses	
Where impact to travelling public needs to be minimized / Projects with massive impact on public	1
Large earthwork projects	1
Large interstate resurfacing projects	1
Highway – non-bridge	1
Inspector Responses	
Complex, urban jobs with a lot of phases	1
No / Can't think of anything	3

Q61. What is the determining factor on when to use a specific contracting method?

Designers, Contractors, and Inspectors all felt owners were the ones to make the determination on when to use a specific contracting method, and not a specific project characteristic. Although Contractors and Inspectors did also mention time-sensitivity, Inspectors mentioned impact on the public.

Table E-98: Responses to I/D Determining Factors

Designer Responses	Times Noted
Client makes that decision	1
Contractor Responses	
Time frame -- duration, from design to implementation / Anything that will shorten the project and get the road cleared faster is good	2
Owner question	1
Inspector Responses	
Impact on the public	2
When you need time / need contractor to finish at a specific time	1
Decision made at executive level	1

Q62. Do all participating parties (owners/designers/contractors) work well under I/D?

With regard to participating parties working well under I/D, Designers felt they are the same as on a traditional low bid project. The majority of Contractors feel all parties work well together. And all Inspector respondents felt all parties work well together, although they did comment on CEIs having potential issues at the later-stages of a job (especially with the PM's acceptance of the final project, and the stop time date being subjective to both the CEI and DOT), and contractors being overly litigious.

Table E-99: Responses to I/D Party Cooperation

Designer Responses	Times Noted
Same as any project with low bid	1
Contractor Responses	
Yes	3
No	1
Inspector Responses	
Yes	5
CEI – conflict with CEI in how PMs accept the final project / actual stop time date is subjective to CEI and DOT	1
Contractors – can be overly litigious	1

Q63. Is there one party that stands out as having the most conflict/difficulty with the method? And how so?

Regarding which party has the most conflict/difficulty with I/D, the Designer respondents provided opposing thoughts – saying the designer will experience conflict, while also saying the designer feels no impact. Contractors noted owners, EORs, and CEIs (who should also have incentives as the contractor's) as parties that stand out as having difficulty with I/D. Inspectors note contractors (as the ones being penalized), owners (with differentiating liquidated savings from disincentives), CEIs (with showing burden of proof in aggressively pursuing incentives), and designers (in working quickly so as not to delay the project) as having conflict with I/D.

Table E-100: Responses to I/D Party Conflict

Designer Responses	Times Noted
Designer is going to be crunched on that	1
No impact to designer	1
Contractor Responses	
No	1
CEI needs the same incentive as the contractor, so they will go fast, too	1
Owner, CEI, EOR	1
Inspector Responses	
No	3
None of the major parties – third parties can screw things up	1
Contractor – they have to meet it or be penalized	1
Owner – disincentive different from liquidated damages	1
CEI – burden of proof to show they didn't aggressively pursue it	1
Designer – has to work quickly because they do not get blamed for delaying the project	1

Q64a. Is FDOT District ___ handling I/D differently than other DOTs/districts/agencies?

[Given the nature of this question, and the variability of responses, a proper analysis of this question cannot be made as it depends on the breadth of experience of the individual respondent. As such, and for the benefit of the district offices, the responses for this question are solely presented for review.]

Table E-101: Responses to I/D District Handling

[District 1]	Respondent	Times Noted
About the same	Designer	1
[District 3]	**Respondent**	**Times Noted**
No	Inspector	1
[District 4]	**Respondent**	**Times Noted**
Do not know	Designer	1
Don't believe so	Inspector	1
[District 5]	**Respondent**	**Times Noted**
I do not know	Inspector	1
No	Inspector	1
[District 6]	**Respondent**	**Times Noted**
They use incentive as claim resolution / easy to make claims go away /	Inspector	1
[District 7]	**Respondent**	**Times Noted**
No	Contractor	1
[District 8]	**Respondent**	**Times Noted**
Same as before	Contractor	1
Turnpike really doesn't do it (they are run by 9 consultants, so the dynamic is different)	Inspector	1

Q64b. Is their method of handling I/D better or worse than other DOTs/districts/agencies?

[Given the nature of this question, and the variability of responses, a proper analysis of this question cannot be made as it depends on the breadth of experience of the individual respondent. As such, and for the benefit of the district offices, the responses for this question are solely presented for review.]

Table E-102: Responses to I/D District Handling Differences

[District 3]	Respondent	Times Noted
No	Inspector	1
[District 4]	**Respondent**	**Times Noted**
Everyone has successes and less than successes	Inspector	1
[District 5]	**Respondent**	**Times Noted**
The same	Inspector	1
[District 6]	**Respondent**	**Times Noted**
Not better or worse -- just the way they do things	Inspector	1

Incentive/Disincentive: FDOT Task Order List of Issues:

a. Regarding special provisions that are specific to project contracting methods … are there any specific items in the special provisions that are ambiguous and/or can be improved upon?

Table E-103: Responses to I/D Special Provisions

Designer Responses
Not sure
Contractor Responses
Not that come to mind
Holding my time extension money. Add it to the contract.

Inspector Responses
(NEB and I/D work the same / tied in with A+B)
Allowable I/D date for disincentive should be tweaked so time between incentive and disincentive doesn't stretch out forever
(Same as A+B) / Must be clear on what moves incentive. Lots of gray areas on what can move an incentive date
No -- don't think so

b. Did the contracting method have an impact/effect on the QC/QA process? / Did something in the contracting method alter the QC/QA process?

Table E-104: Responses to I/D QC/QA

Designer Responses
No
Contractor Responses
No
CEI -- same as A+B
No, but I can see how it could
Don't' think so
Inspector Responses
No
When they see they're at the end and incentive not met, more pressure on DOT to accept job a little quicker / Think the goal of the DOT is to give them incentive

c. Are the contracting methods typically appropriate for the project types? / For projects with bonuses/incentives, are the values set at an appropriate level (i.e., do the values properly reflect daily road-user costs)?

Table E-105: Responses to I/D Appropriate Selection

Designer Responses
Not sure
Contractor Responses
Yes
The incentive should be big enough to make the contractor take the necessary risk
Inspector Responses
Yes / Yes, for the most part
DOT believes they are / I/D intent is there, gets contracts to finish early / Yes, bigger jobs have bigger incentives
Yes -- I/D can work for any project type / Hard to say -- seems so
[no response for first half] / Yes, that is how we calculate them. We determine how much money we have available for bonus, or Incentive/Disincentive, I have my guy go back to calculate the road user cost. If it is $10,000 or $15,000 a day, then that is what we usually set our incentive at. It is something that matches the road user cost.

d. Are the bonuses/incentives worth it (to the contractor) to increase construction efforts to complete the project early/on time? If not, what should the values be?

Table E-106: Responses to I/D Bonuses

Designer Responses
Not sure
Contractor Responses
Yes
Should be tied to degree of difficulty
Usually they are
Like to see them larger / given risks you're taking, what is the right reward for those risks
Inspector Responses
Usually, yes
No -- but if you made it work their effort, it would be hellaciously expensive
Yes, can be

e. Regarding how the FDOT distributes projects by contracting method … are they picking the right projects for their program (i.e., are there enough DB vs. LS projects)? How can they do better?

Table E-107: Responses to I/D Distribution

Designer Responses
Not sure
Contractor Responses
Yes. / They've not had I/D projects much lately
We don't see enough of it. All the ones they choose are well-suited, but they should do more
Seen good use of I/D
Inspector Responses
Yeah, could use I/D more, but ones it is on work
With I/D jobs, they're generally is a good project for it … implementation of it could use a little more work
Sometimes, hard to say

<u>Incentive/Disincentive: Refuted Literature</u>:

- **I/D often results in utility conflicts**

Table E-108: Responses to I/D Refuted Literature Statement #1

Designer Responses
It should not be any more.
Contractor Responses
Disagree – I/D has no play on utilities
Inspector Responses
Don't see how it has anything to do with it
Never noticed / usually dealt with up front anyways
No -- utility conflicts and lack of investigation

- **I/D often results in reduced quality**

Table E-109: Responses to I/D Refuted Literature Statement #2

Designer Responses
Should not be.
Contractor Responses
Should not in my opinion
Inspector Responses
Anytime contractor is rushed, can reduce quality … must inspect properly
At end of job, I can see that happening
Not if construction manager's doing job properly

<u>**Incentive/Disincentive: Conflicting Issues**</u>**:**

- **100% of contractors <u>do not</u> believe I/D often results in reduced quality, while 50% of designers and 53% inspectors believe it does**

Table E-110: Responses to I/D Conflicting Issue #1

Designer Responses
It should not affect quality.
Contractor Responses
Agree with contractors … if base time is sufficient before incentive and dis, it should not … designers and dot set the base timeline (i.e., if done at 400 days … in at 350 … they should get the time reasonable … can't just shift everything is not the same in this state – (state spread out)
Inspector Responses
Rushing to achieve a goal can reduce quality, but specs in place to hold team liable
For inspectors, they see contractor rushing
Agree with contractors / half of Designers and Inspectors aren't doing what they have to do to attain quality / Department (in last 10 years) have put quality on the contractor -- contractor has to attain it regardless of contracting method

- **69% of inspectors and 57% of designers believe I/D increases need for field inspections, while 62% of contractors believe it <u>does not</u>**

Table E-111: Responses to I/D Conflicting Issue #2

Designer Responses
Contractors never think inspectors are needed.
Contractor Responses
Base time is the problem – get that to a reasonable threshold – if to short, contractor rushing to meet deadline, more inspectors could potentially be needed - "treating symptom not the cause"
Inspector Responses
Does increase need for inspection / Caveat -- more hours to meet what contractor is doing (i.e., overtime, weekends)
Don't see much of a bump that would require … maybe at last 1/3
Don't think that it does

- **53% of designers <u>do not</u> believe I/D is best suited for projects where the safety of road users or construction workers is at risk, while 71% of contractors and 79% of inspectors believe it is**

Table E-112: Responses to I/D Conflicting Issue #3

Designer Responses
(none)
Contractor Responses
Because designer is in an office, not on the side of the road
No matter what method used, should never cut back on safety – so if MOT design is good, it should not be an issue … don't' see why ID not be used
Inspector Responses
Good if finishing early … don't think they work unsafe --> OSHA
Agree with Inspectors and Contractors -- doesn't matter
Agree that it is … incentive can't reduce safety --> separate issue

Lump Sum

It should be noted that after our initial interview, the research team realized that there may have been confusion between "lump sum" as a method of contract payment (typical with Design Build projects) and Lump Sum as a contracting method (typically used with Design Bid Build). Efforts were subsequently made to differentiate the two in all future interviews, and ensure the respondents were answering the questions appropriately.

Q65. Does Lump Sum work well as a stand-alone method?

The majority of Designer respondents feel Lump Sum works well as a stand-alone method, although two commented on it working well with the right project. Contractor respondents also feel Lump Sum works well, also noting in some instances. Inspector respondents also feel Lump Sum works well alone, also mentioning it working well with the right project, and working well on small projects.

[The table below includes "overall statements" made by a few interview participants. These individual responses were provided in lieu of answering the entire section of questions, and are usually due to participants not having sufficient experience but still possessing a general opinion on the matter.]

Table E-113: Responses to Lump Sum Stand-Alone

Designer Responses	Times Noted
Yes	8
No	1
Works fine, if right project	2
[respondent referring to lump sum as contract payment for DB:] Yes	1
[respondent referring to lump sum as contract payment for DB:] Isn't as good as stand alone, but works best with DB	1
[overall statement for this section:] No experience -- more contractor related	*1*
Contractor Responses	
Yes	3
In some instances	1
Inspector Responses	
Yes	9
Works well on small project	1
If done for right project	1
Encountered challenges with LS and DBE contractors that do not have experience with the department	2

Q66. In your opinion, do you like Lump Sum?

All Designer respondents said they liked Lump Sum, noting the following: they like it only for certain projects; design efforts are less, but it's hard to negotiate change orders; and quantities must be easily derived. The majority of Contractor respondents said they like Lump Sum, with one individual noting they like it for the right job. All Inspector respondents also liked Lump Sum, noting: it's all-inclusive; they like it for the right job (as suggested by Designers and Contractors); it makes the CEI's work easier; and the problems encountered are when adding/deleting work (also noted by Designers).

Table E-114: Responses to Liking Lump Sum

Designer Responses	Times Noted
Yes	8
For certain projects	1
Design effort is less, but it is difficult to negotiate any change orders	1
Quantities have to be derived easily because there is no designer to help contractor	1
Contractor Responses	
Yes	5
No	1
For the right job	1
Inspector Responses	
Yes	5
Pro: all-inclusive	1
Problems encountered when adding/deleting work – don't know what the costs are (have to come up with fair compensation for the addition)	1
For the right job	1
Makes CEI side easier	1

Q67. What is the best feature of Lump Sum?

Designers felt the best features of Lump Sum are the streamlined process (reduced time and reduced design efforts – placing responsibility on the contractor instead of the designer); as a contractor, receiving a well-enough compensation essentially for being efficient; and having clear and understandable plans and reviews in order to obtain a better quality product from the contractor. Designers also commented on the risk on the part of the owner. Contractors felt the best features included: knowing what you will be paid; increased compensation due to increased risk; focus placed on the quality of the design and estimate; prevents irresponsible bidding; reduces the number of competitors; reduces bureaucratic pay item disputes; and saves time and energy. Inspectors, like Designers and Contractors, note the time-savings aspect, and the need for proper scope definition; in addition to the all-inclusive total price, and the avoidance of disputes.

Table E-115: Responses to Lump Sum Best Feature

Designer Responses	Times Noted
No need to guess pay items / Lack of having to generate pay items in quantity – puts the responsibility on the contractor rather than the designer / Streamlining of the process / Design effort is less	4
From the contracting side, if you do the job well, you get a very good profit – incentive of being efficient	2
Having clear and understandable plans is key – because that's what they are going to get / Thorough reviews by client, so less uncertainty – provides better product for the contractor to bid on / gets the community's buy-in	2
All the risks on the owner's side disappears	1
When fewer subs are require by the prime -- more people to rely upon equates with more risk	1
Contractor Responses	
You know what you will be paid	1
Opportunity to make more money because we take more risk	1
Puts focus on quality of estimate and design	1
Reduces petty, bureaucratic, time-wasting arguments about pay item issues	1
Is a significant obstacle to irresponsible bidding	1

Reduces number of competitors	1
Contractor responsible for quantities	1
Time and energy savings (for measuring)	1
Inspector Responses	
No pay items to track / Less time spent on researching quantities	2
Scope of work has to be properly defined and showed in the design / Department must have well-defined scope of work -- be very careful	2
All-inclusive -- one pay item, includes everything / Total cost is fixed	2
Does not leave room for disputes / Avoids ambiguity in payment and pay items	2
Best for small, cut-and-dry, basic projects (i.e., sidewalks)	1
Most straightforward contracting method	1
Less project cost in terms of the owner's delivery	1

Q68. What is the worst feature of Lump Sum?

Designers, Contractors, and Inspectors all mostly felt the worst feature of Lump Sum was the issues encountered when encountering unforeseen issues or negotiating change orders – a lot of work is involved in coming up with a fair and equitable compensation for work (through negotiations or time-delaying Supplemental Agreements). Additional issues brought up by Designers include: when a major issue arises, contractors may default, causing problems for the owner; heavy disparity between bids (due to inflated contract prices to account for potential unknowns); and while construction costs are saved, engineering costs are still heavy with having to calculate project quantities. Additional issues brought up by Contractors include: plan errors and poor drawings; the shift of risk to the contractor; unknowns; and additional time required to perform takeoffs. Additional issues brought up by Inspectors include: inflated bids to compensate for unknowns; and pay adjustments and penalties for failed tests.

Table E-116: Responses to Lump Sum Worst Feature

Designer Responses	Times Noted
Lack of maneuverability with paid items in the contract and overruns – very difficult to file claims / Difficult to negotiate any change orders when prices have not been established / Can have SAs that delay projects for years. / Contractor is geared to going for SAs	4
If you mess up, you're going to feel it / When there is a problem, contractor may default and owner will be in trouble	3
Level of disparity between bids (from construction side) / Inflated contract price	2
Saves construction costs, but not engineer costs – still have to calculate project quantities	1
Contractor Responses	
Plan errors / poor drawings	2
Shifts the risk to the contractor	2
Any unknown or DSC	1
Takes more time to do the takeoff and provide the bid	1
Inspector Responses	
Encountering problems and unforeseen issues / Change orders = work orders / Extra work (by contract administration personnel) to come up with a fair and equitable compensation for work	4
Inflated bids to compensate for what may be missing	2
Pay adjustments and penalties for failed tests	1

Q69. Would you consider Lump Sum a successful contracting method, as currently being used by FDOT?

Designer, Contractor, and Inspector respondents all felt Lump Sum was successful, as currently used by the FDOT. Of note, a Contractor respondent stipulated it was successful when used in small, easy, and repetitive jobs where the scope is well-understood.

Table E-117: Responses to Lump Sum Success

Designer Responses	Times Noted
Yes	7
[respondent referring to lump sum as contract payment for DB:] As long as job is DB – not if DBB	1
Contractor Responses	
Yes	6
Using it for small jobs where scope is well understood, reasonably easy and repetitive	1
Inspector Responses	
Yes	6

Q70a. Is Florida using Lump Sum to its greatest potential?

The majority of Designer, Contractor, and Inspector respondents feel Florida is using Lump Sum to its greatest potential. Of the commentary, the Designers say Lump Sum has, over the years, become better balanced; the department has done a good job picking the right jobs for Lump Sum, and should use it more often; and its greatest potential is with simple, well-defined projects.

Table E-118: Responses to Lump Sum Potential

Designer Responses	Times Noted
Yes	6
No	1
Better balance, now, with LS use	1
Could probably expand its use	1
For the simple and well-defined projects	1
Have done a good job getting the right projects in as LS	1
Contractor Responses	
Yes	3
No	2
Inspector Responses	
Yes	6
No	1

Q70b. If not, how is it being underutilized?

Of the notable responses for this question, Contractor and Inspector respondents both think Lump Sum is underutilized simply by not being used enough.

Table E-119: Responses to Lump Sum Underutilization

Designer Responses	Times Noted
[respondent referring to lump sum as contract payment for DB:] Can use LS on all projects but DB	1
[respondent referring to lump sum as contract payment for DB:] Can be used more on smaller DB projects	1

Contractor Responses	
Not used enough	1
Inspector Responses	
Don't think they're using it very much	1

Q71. What can FDOT do with the implementation of Lump Sum to improve its use?

To improve its use, the Designers suggested ensuring the design plans were complete; ensuring the right types of project are used for Lump Sum; and eliminating extra work by using takeoffs for both the engineer's estimate and CEI's estimate (rather than having each perform individual takeoffs). Contractors suggested using Lump Sum more frequently; ensuring the RFP is clear; and ensuring the right types of projects are used for Lump Sum (particularly one that is simple). Inspectors also suggested using it more frequently; ensuring the scope is well-defined; and quantifying the scheduled values and their prices.

Table E-120: Responses to Lump Sum Implementation

Designer Responses	Times Noted
Ensure design plans are complete so that there's no surprises for the contractor	2
Do not do quantity takeoff twice for LS projects – need engineer's estimate to program the money for that particular project … CEI can use this same estimate to check the quantities put in place	1
Ensure it's the right project type	1
Nothing – such a small part of the program	1
Not sure	2
[respondent referring to lump sum as contract payment for DB:] More clearly target projects that would be good for DB	1
Contractor Responses	
Use it more frequently	1
Make sure the RFP is very clear	1
Ensure it is a simple enough project (quantities are easily quantified)	1
Proper project selection	1
Inspector Responses	
Use it more	1
Have a well-defined scope of what the work entails	1
Quantify the scheduled values and prices associated	2

Q72. To benefit from the advantages of Lump Sum, what does the FDOT need to do?

To benefit from Lump Sum, Designers suggested using it with simple projects where quantities can be derived; ensure the right types of projects are selected for Lump Sum; consider finding a way to create the engineer's estimate without doing quantity takeoffs; ensure all items of work are included with the price; and allow the firm that performed the PD&E to do the design. Contractors suggested using Lump Sum more often, and only using Lump Sum with projects where quantities are known. Inspectors suggested developing clear plans and a well-defined scope; selecting the right types of projects for Lump Sum; and refining the pay adjustment process.

Table E-121: Responses to Lump Sum Advantage Benefits

Designer Responses	Times Noted
Use it with simple projects where quantities can be derived	1
Ensure the right type of project is selected for LS	1
Develop method to create engineer's estimate without doing quantity takeoff	1
Ensure all items of work are spelled out and contractor includes them in price	1
Let the firm that does the PD&E do the design	1
Don't think there's anything more that can be done	2
[respondent referring to lump sum as contract payment for DB:] Need to utilize their existing criteria to target potential DB jobs	1
Contractor Responses	
Use it more	2
Limit it to projects where the quantities are well known	1
Inspector Responses	
Come up with well-defined scope / clear plans	2
Refine the pay adjustments process	1
Select the right project	1

Q73. What are your greatest concerns regarding Lump Sum?

Some of the Designers' greatest concerns include: the need for complete plans; cutting corners by contractors; ensuring the estimate is done correctly; and the difficulty in negotiating change orders when prices are not established. Contractors' greatest concerns include: the need for complete and clear plans (for accurate quantity takeoffs); ensuring work (scope) is understood, and quantities are known; that there are wide variations in the bids; and that Lump Sum will not be used often enough. Inspectors' greatest concerns include: inexperienced contractors missing important details; errors/changes in the plans; lack on information on how contractors arrived at costs; change orders; and the use of Lump Sum on complex problems having unforeseen problems.

Table E-122: Responses to Lump Sum Concerns

Designer Responses	Times Noted
Plans need to be complete	2
Cutting corners	1
Ensuring everything estimated correctly	1
Difficult to negotiate change orders when prices have not been established	1
None	1
Contractor Responses	
Plans need to be clear / Provide complete plans that allows accurate quantity takeoffs	2
Ensure work is clearly understood and the quantities known	1
That they won't use it enough	1
Wide variation in bid amounts	1
Inspector Responses	
Inexperienced contractors – missing important items	2
If there are plan errors/changes, it is hard to handle	1
Lack of information at how contractor arrived at a cost	1
Used for too complex projects, or have inherent problems (i.e., with utilities)	1
Change orders	1

Q74. When is Lump Sum a disadvantage?

Designer, Contractor, and Inspector respondents all said Lump Sum was a disadvantage during the following circumstances: when the project is too big, and when the quantities are unknown (or there are quantity concerns). Other concerns include when there are unforeseen conditions/unknowns (noted by Designers and Contractors); when the project is too complex (noted by Designers and Inspectors); and when the scope is not clear, the plans are not complete, or the plans have errors (noted by Contractors and Inspectors). Designers also addressed concerns when schedules must be accelerated, and when the FDOT is aware of potential problems and does not inform the designer or contractor. Contractors addressed when bidders neglect to read the drawings or understand how the project shall be built. And Inspectors addressed when the project is specialized.

Table E-123: Responses to Lump Sum Disadvantage

Designer Responses	Times Noted
When there are unforeseen conditions/unknowns	3
When the project is too complex/complicated	2
When the project is too big – (too risky for contractors)	1
When there are quantity concerns / When quantities are unknown	1
When schedule must be accelerated	1
When FDOT knows about potential problems and does not share info with designer or contractor	1
Contractor Responses	
When competitors don't read the drawings / When bidders do not understand how the project will be built	2
When scope is not clear / When plans are not complete / When plans have errors	2
When the project has a lot of utilities/unknowns	1
When the project is too big	1
When there are quantity concerns / When quantities are unknown	1
Inspector Responses	
When scope of work is not clearly defined / When project has design errors / When design is not complete	3
When project is specialized	2
When project is too complex	1
When the project is too big	1
When there are quantity concerns / When quantities are unknown	1

Q75. What types of projects do you feel works best with Lump Sum?

Respondents mentioned several different types of project they feel work best with Lump Sum. Among the majority of Designers, Contractors, and Inspectors, they all noted simple, straightforward projects, as well as milling/resurfacing jobs. Further, Designers noted the following: well-defined project with clear scopes; projects with few unknowns; and small bridge replacement. Contractors noted highways, but were keen to point out no bridge work (counter to the Designers' and Inspectors' views). Inspectors noted landscape and sidewalk jobs; bridges; lane widening, and intersection modifications.

Table E-124: Responses to Lump Sum Best Type Projects

Designer Responses	Times Noted
Well defined / Clear scope	3
Simple, limited number of pay items	3
Milling/resurfacing jobs	2

Few unknowns	1
Large public benefit	1
Small bridge replacement	1
Design Build	1
Drainage improvement – if well defined in time and material	1
Heavy utility adjustments, controversial projects, big ROW projects, projects with heavy environmental impacts	1
Contractor Responses	
Milling/resurfacing jobs / rural resurfacing	3
Simpler, straightforward, repetitive	2
Highways, not bridges	1
All	1
Inspector Responses	
Resurfacing jobs	4
Landscaping/sidewalk jobs	3
Bridge projects, except for foundation / minor bridge	2
Small, straight forward, basic work	2
Lane widening	2
Intersection modification and improvements (e.g., adding traffic signals)	2
Clearly defined and the quantity of work is well known	1

Q76. Are there other features of a project (besides type) that would lend itself to work best with Lump Sum?

Designer respondents noted the following as features that would lend themselves for Lump Sum: project duration (short term jobs), scope and type, rehabilitation projects, safety improvement projects, and emergency contracts. Contractor respondents noted smaller rural jobs and simple projects (with known quantities) as those that lend themselves for Lump Sum. Inspector respondents also mentioned simple projects, rural projects, those with limited underground components, and those with minimum outside influences.

Table E-125: Responses to Lump Sum Working Best with Specific Features

Designer Responses	Times Noted
Short-term duration contracts (i.e., 3-4 months)	1
Scope and type	1
Rehab projects (i.e., 3R projects)	1
Safety improvement projects	1
Emergency contract jobs	1
Contractor Responses	
Smaller, simpler rural projects	1
Simple and known quantities	1
Inspector Responses	
Simple projects	2
Rural projects	2
Projects with limited underground components (i.e., utility, drainage, etc.)	2
Minimum outside influences	2
Smaller projects	1
Standard index work	1
Clearly defined scope or work	1

Q77. What is the determining factor on when to use a specific contracting method?

Designer respondents thought the straight-forwardness of a project (as in being easy to quantify), the complexity and scope, and there being a benefit to the public as all determining factors on selecting specific methods. Designers also, however, noted this being a question for the client or owner to decide. Contractor respondents felt the timeframe/duration of a project was the determining factor in selecting the contracting method. And Inspector respondents felt the complexity, time, scope, size, and amount of preliminary studies performed were all determining factors on selecting contracting method.

Table E-126: Responses to Lump Sum Determining Factors

Designer Responses	Times Noted
Straight forward projects – those easy to quantify	2
Client makes this decision / Question for the owner	2
When there's a great public benefit	1
Complexity and scope	1
[respondent referring to lump sum as contract payment for DB:] That the DOT performs the PD&E	1
[respondent referring to lump sum as contract payment for DB:] That the Traffic demands are identified	1
Contractor Responses	
Time frame / duration (from design to implementation) / shortening project to clear road faster	2
Inspector Responses	
Amount of preliminary studies/permitting will be needed	1
Scope of work and size	1
Complexity and time	1

Q78. Do all participating parties (owners/designers/contractors) work well under Lump Sum?

The majority of Designer and Contractor respondents, and all Inspector respondents, felt participating parties work well with Lump Sum. Designers noted the owner has the most difficulty with the CEI staff having problems with the lack of tracking flexibility, the plans have to be clear, and Lump Sums makes the contractor an adversary to the designer. Contractors noted the CEIs do not like Lump Sum because it is hard to justify their contracts. And Inspectors noted designers have more difficulty because design is a little hard, and all mostly work well as long as the project doesn’t have any issues.

Table E-127: Responses to Lump Sum Party Cooperation

Designer Responses	Times Noted
Yes	4
No	2
Owner – difficult for CEI staff to execute project because there used to be flexibility to track	1
Plans have to be clear	1
LS makes the contractor an adversary to the designer	1
Don’t think much difference / Not sure	2
Contractor Responses	
Yes	2
No	2
CEI – hate it because it is hard for them to justify the size of their contracts	1
Inspector Responses	
Yes	6
Designer – design is little harder	1
As long as the project doesn't have any issues	1

Q79. Is there one party that stands out as having the most conflict/difficulty with the method? And how so?

While the several Designer, Contractor, and Inspector respondents felt there was no one party that stood out as having issues with Lump Sum, they still mentioned a few individuals. Designers commented on the designers (standing between owner and contractor; not compensated for still having to generate estimates for the department); the contractors (preferring paid items); and the owners. Contractors commented on the FDOT (with difficulty agreeing on project scope) and CEIs (in having problems justifying the size of their contracts – with not having paid items to verify). Inspectors commented on the owners (as the middle man between designer and contractor); the contractor (with wanting to get paid for any minor change); and the designers (with their intent not holding up while enforcing contract requirements).

Table E-128: Responses to Lump Sum Party Conflict

Designer Responses	Times Noted
No	4
Designer – conflict between owner and contractor (working with contractor, but they want a good relationship with the owner) / still have to do all the work to generate the estimate to the department even though not in the plans, you still have to do the work / not fully compensated as with a traditional job	2
Contractor – prefer paid items	2
Owner	1
Don't see conflict unless problem in plans	1
Contractor Responses	
No	1
FDOT – difficulty agreeing on the project scope	1
CEI – hard to justify the size of their contracts	2
Inspector Responses	
No	2
Owner – becomes middle man (designer saying it is clear, and contractor saying it's not)	2
Contractor – want to get paid for any minor changes	1
Designer – intent does not hold up with trying to enforce contract requirements	1
Can be any one – depends on who's on what end of receiving	1

Q80a. Is FDOT District __ handling Lump Sum differently than other DOTs/districts/agencies?

[Given the nature of this question, and the variability of responses, a proper analysis of this question cannot be made as it depends on the breadth of experience of the individual respondent. As such, and for the benefit of the district offices, the responses for this question are solely presented for review.]

Table E-129: Responses to Lump Sum District Handling

[District 1]	Respondent	Times Noted
Think they are the same. D1 has a lot of large projects – gravitate towards DB	Designer	1
Don't know	Designer	1
[District 2]	**Respondent**	**Times Noted**
D2 is the only place I see an implementation	Designer	1
No	Inspector	2
[District 3]	**Respondent**	**Times Noted**
No	Contractor	1
Same	Inspector	1

[District 4]	Respondent	Times Noted
Not that we've seen	Designer	1
Not sure	Designer	1
[District 5]	**Respondent**	**Times Noted**
No comments	Inspector	1
No	Inspector	1
[District 6]	**Respondent**	**Times Noted**
Over 20 years not having seen one	Inspector	1
Don't think so (only done LS in D6)	Inspector	1
[District 7]	**Respondent**	**Times Noted**
No – reviews and submittals are sometimes different	Designer	1
They did with our job – but ours was the first LS D7 had done in 10-12 years	Designer	1
Don’t know	Inspector	1
[District 8]	**Respondent**	**Times Noted**
No, don’t think so	Designer	2

Q80b. Is their method of handling Lump Sum better or worse than other DOTs/districts/agencies?

[Given the nature of this question, and the variability of responses, a proper analysis of this question cannot be made as it depends on the breadth of experience of the individual respondent. As such, and for the benefit of the district offices, the responses for this question are solely presented for review.]

Table E-130: Responses to Lump Sum District Handling Differences

[District 1]	Respondent	Times Noted
[District 1] It's better	Designer	1
[District 2]	**Respondent**	**Times Noted**
[District 2] I don’t know	Designer	1
[District 2] Same	Inspector	2
[District 3]	**Respondent**	**Times Noted**
N/A	Contractor	1
[District 4]	**Respondent**	**Times Noted**
Can't say	Designer	1
[District 5]	**Respondent**	**Times Noted**
The same	Inspector	1
[District 6]	**Respondent**	**Times Noted**
No better or worse	Inspector	1
[District 7]	**Respondent**	**Times Noted**
D7 is better	Designer	1
Different – more combative. Partnering would help	Designer	1

Lump Sum: FDOT Task Order List of Issues:

a. Regarding special provisions that are specific to project contracting methods … are there any specific items in the special provisions that are ambiguous and/or can be improved upon?

Table E-131: Responses to Lump Sum Special Provisions

Designer Responses
(Too many to say)
I don't review.
Not that I can think of.
Not sure
Don't know
Contractor Responses
There should be no S/P on a Lump Sum project. We should know exactly what we are doing
No
Inspector Responses
With minor field changes --> plan quantity item rule => needs to be a better definition of percentage of plan quantity items (allowances for being off) / When do you pay and when to deduct
Nothing

b. Did the contracting method have an impact/effect on the QC/QA process? / Did something in the contracting method alter the QC/QA process?

Table E-132: Responses to Lump Sum QC/QA

Designer Responses
Not at all
I don't think so. We do our standard reviews no matter what lump-sum methods.
It's the same process.
Have to keep in mind the method when preparing the pay and scope notes.
No
Contractor Responses
Yes / Interpretations about what the plans are saying cause this. Goes back to need for very clear, concise plans
No. Same requirements
No
Do not
Inspector Responses
Don't think so. QC/QA process is pretty standard. For LS, no specific pay item -- QC for material specific. generally by pay items (for DB, contractor provides materials and how to test them)
No
Same

c. Are the contracting methods typically appropriate for the project types? / For projects with bonuses/incentives, are the values set at an appropriate level (i.e., do the values properly reflect daily road-user costs)?

Table E-133: Responses to Lump Sum Appropriate Selection

Designer Responses
(same) / Good with LS
I don't know
It's not much difference between the two except for having not enter the paid items for transport and having not the matriculation sheet in the plans. But other than that, you still have to generate those quantities to provide an accurate estimate. Sometime you don't get compensated for.
Not sure

Usually / Usually
Contractor Responses
Yes
Inspector Responses
Most of the time they are -- Yes
Yes, simple

d. (*Directed toward Designers*) What do you do differently in the design process for a LS project than you do for a traditional/conventional (DBB) project? / (*Directed toward Inspectors*) Does the use of LS permit you more time/effort to focus on other aspects of inspection?

Table E-134: Responses to Lump Sum Design Process

Designer Responses
Nothing different -- no quantity items / pressure on contractors
Have to keep in mind the method when preparing the pay and scope notes.
Not really
Contractor Responses
Contractors not involved unless it's DB
Inspector Responses
Designer need to come up with well-defined scope -- no misinterpretations (all know the design) / Probably yes
If I were a designer, would be careful --> can't over or underrun for quantities / (More pressure to be accurate) / You do, as an inspector, still inspect / They prefer the pay items … have the pay item mentality, but it's LS
Yes, it does allow the inspector to spend more time watching.
Yes

e. Regarding how the FDOT distributes projects by contracting method … are they picking the right projects for their program (i.e., are there enough DB vs. LS projects)? How can they do better?

Designers, Contractors, and Inspectors all commented that the FDOT is picking jobs appropriately for Lump Sum.

Table E-135: Responses to Lump Sum Distribution

Designer Responses
Yeah, doing a pretty good job as far as LS is concerned / Yes, they pick appropriately when they pick LS
Not sure
Contractor Responses
Yes
They are picking the right jobs for LS
Inspector Responses
Would say yes / Think so

Appendix F: Interview Data Acquisition Breakdown

Appendix F includes a detailed breakdown of experience for interview participants. This information is provided solely for the benefit of the FDOT in observing the familiarity of the highway construction community with existing administrative procedures.

Reported years of personal experience for the interview respondents are presented in Table F-1. These numbers are representative of the interview candidates that provided responses in their surveys. Highlighted and bolded numbers represent how many years the majority of the participants reported experience. For instance, the majority of Designers, Contractors and Inspectors, alike, reported having 11 to 15 years of experience with alternative contracting methods, in general.

Table F-1: Interview Respondent Reported Years of Personal Work Experience

			Contracting Method					
			Alternative Contracting Methods (in general)	DB	A+B	NEB	I/D	LS
Designers	Years of Personal Experience	**20 +**	1	1	2	2	3	3
		16 to 20	4	3	3	2	3	3
		11 to 15	**8**	**7**	1	1	1	**4**
		6 to 10	3	2	3	3	**4**	**4**
		1 to 5		3	**4**	2	2	2
		0			3	**6**	3	
		Years Exp. of Majority:	**11 to 15**	**11 to 15**	**1 to 5**	**0**	**6 to 10**	**6 to 15**
Contractors	Years of Personal Experience	**20 +**	3	2	2	2	2	2
		16 to 20	2	2	**4**	2	3	**5**
		11 to 15	**4**	**4**	**4**	**6**	**5**	3
		6 to 10	1	1			1	1
		1 to 5	1	1	1	1	1	1
		0		2	1	1		
		Years Exp. of Majority:	**11 to 15**	**11 to 15**	**11 to 20**	**11 to 15**	**11 to 15**	**16 to 20**
Inspectors	Years of Personal Experience	**20 +**	1		1	1	3	3
		16 to 20	4	1		2	1	2
		11 to 15	**10**	4	2	3	3	**9**
		6 to 10	8	9	2	6	9	6
		1 to 5	7	**13**	**18**	**11**	**11**	**9**
		0	1	4	8	8	4	1
		Years Exp. of Majority:	**11 to 15**	**1 to 5**	**1 to 5**	**1 to 5**	**1 to 5**	**1 to 5 and 11 to 15**

Reported number of project experience for the interview respondents are presented in Table F-2. These numbers are representative of the interview candidates that provided responses in their surveys. Highlighted and bolded numbers represent how many projects the majority of the participants reported experience. For instance, the majority of Designers and Contractors reported having 11 to 20 projects of experience with DB, whereas Inspectors reported having one to five projects of experience with DB.

Table F-2: Interview Respondent Reported Number of Project Experience

		Contracting Method				
		DB	**A+B**	**NEB**	**I/D**	**LS**
Designers						
Number of Project Experience	**51 to 100**					3
	21 to 50	3		1	2	2
	11 to 20	**5**	1		1	1
	6 to 10	4	4	1	1	4
	1 to 5	3	**8**	**7**	**7**	**5**
	0		3	6	4	
	Projects of Majority:	**11 to 20**	**1 to 5**	**1 to 5**	**1 to 5**	**1 to 5**
Contractors						
Number of Project Experience	**51 to 100**	1	1	1	1	1
	21 to 50	**4**	2			3
	11 to 20	2	3	1	3	2
	6 to 10	2	1	2	3	2
	1 to 5	1	**4**	**7**	**5**	**4**
	0	2	1	1		
	Projects of Majority:	**21 to 50**	**1 to 5**	**1 to 5**	**1 to 5**	**1 to 5**
Inspectors						
Number of Project Experience	**51 to 100**				2	2
	21 to 50		1		1	6
	11 to 20	2		1	3	1
	6 to 10	6	1	2	4	4
	1 to 5	**18**	**20**	**18**	**15**	**17**
	0	4	9	10	6	1
	Projects of Majority:	**1 to 5**	**1 to 5**	**1 to 5**	**1 to 5**	**1 to 5**

Table F-3 and Figure F-1 show the responses provided by the interview participants. Design Build shows to be the most popular of contracting methods among the interview participants, with Lump Sum following behind. Among all three participant categories, A+B, No Excuse Bonus, and Incentive/Disincentive are the least popular. And while these numbers may not necessarily reflect the prevalence or popularity of any particular contracting method (since the pool of interview candidates was limited), it is still worth mentioning.

Table F-3: Alternative Contracting Method Response by Participant Category

	DB	**A+B**	**NEB**	**I/D**	**LS**
Designers	13	6	3	3	10
Contractors	7	5	3	5	6
Inspectors	16	8	8	6	9
Totals:	**36**	**19**	**14**	**14**	**25**

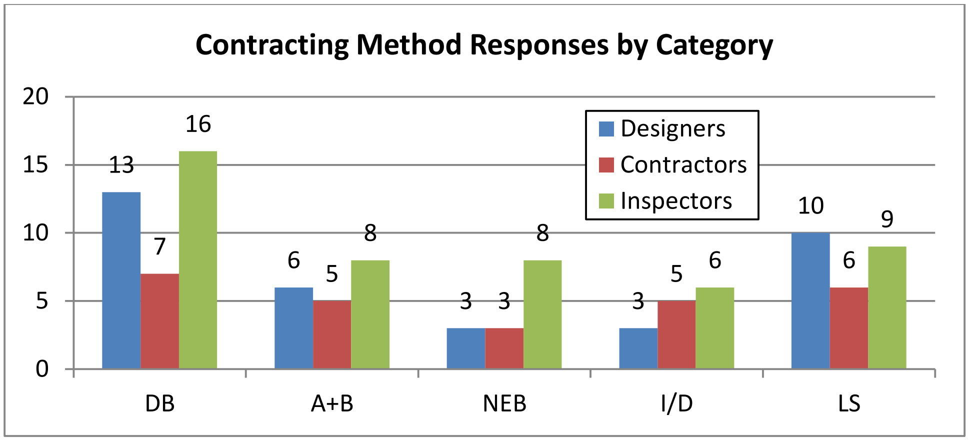

Figure F-1: Contracting Method Responses by Category

Appendix G: Cost, Time, and Quality Performance Data and Analysis

Appendix G includes the time and cost savings data per project delivery system for the individual cost categories.

First, tables with detailed breakdowns for percentage savings, as well as their representative time savings in days, and cost savings in dollars, are provided. Then, the overall percentages of projects, per delivery method, are also presented showing those performing under contract, at contract, and over contract amount for both cost and time. Summary tables present the specific number of projects that finished early or late, or that encountered cost escalation or savings. Comprehensive time and cost data tables, categorized by cost range and broken out by project delivery method, are shown in Appendix J.

Throughout, negative percentage change of days used over current represents a <u>positive savings</u> in contract days (with a corresponding positive average days saved per project), while a positive percentage change of days used over current represents a <u>negative savings</u> in contract days (with a corresponding negative average days saved per project). In simpler terms, negative time values suggest average and percentage time saved; while positive time values reflect average and percentage project time delays based on the equations presented in Chapter 3.

Likewise, negative percentage change of actual over current cost represents a positive savings in costs (with a corresponding positive average costs saved per project), and a positive percentage change of actual over current cost represents a negative savings in costs (with a corresponding negative average costs saved per project, as identified by parentheses). Again, in simpler terms, positive cost values indicate cost escalation in both average and percentage forms; while negative cost values (in parentheses) represent average and percentage cost saved according to the equations presented in Chapter 3.

Table G-1 shows the breakdown of projects over $20 million based on the actual cost compared to the current contract cost. The three column categories based on that comparison were Projects Finished with Cost Underrun, Projects Finished at Current Contract Cost, and Projects Finished with Cost Overrun. Design Bid Build had 23% of the projects finish with cost underruns and 77% of the projects finish with cost overruns. Design Build (Major) had 41% of the projects finish with cost underruns, and 59% of the projects finish with cost overruns. A+B had 50% of the projects finish with cost underruns, 17% finish at current contract cost, and 33% of the projects finish with cost overruns.

Table G-1: Cost Analysis for Projects over $20 Million

Above $20 Million								
Project Delivery Method	Total	Projects Finished with Cost Underrun		Projects Finished at Current Contract Cost		Projects Finished with Cost Overrun	
Design Bid Build	30	7	23%	0	0%	23	77%
DB (Minor)	3	0	0%	0	0%	3	100%
DB (Major)	22	9	41%	0	0%	13	59%
Lump Sum+	1	1	100%	0	0%	0	0%
Incentive/Disincentive+	3	1	33%	0	0%	2	67%
A+B	6	3	50%	1	17%	2	33%
No Excuse Bonus+	1	0	0%	0	0%	1	100%

+ *No interpretations have been made for categories with fewer than 5 projects*

Table G-2 shows the breakdown of projects over $20 million based on the days used compared to the contract duration. The three column categories based on that comparison were Projects Finished Early, Projects Finished On Time, and Projects Finished Late. A+B had 67% of the total projects finish early, and the remainder finishing on time. Design Bid Build had 56% of the projects finish early, 37% of the projects finish on time, and 7% of the projects finish late. For all of the delivery systems the number of projects finished early was more compared to the other columns. As a result, the delivery systems had an overall shorter duration compared to the contract duration.

Table G-2: Breakdown of Early, Late, and On Time Finishes for Projects over $20 Million

Above $20 Million								
Project Delivery Method	Total	Projects Finished Early		Projects Finished On Time		Projects Finished Late	
Design Bid Build	30	17	57%	11	37%	2	7%
DB (Minor)+	3	3	100%	0	0%	0	0%
DB (Major)	22	11	50%	11	50%	0	0%
Lump Sum+	1	1	100%	0	0%	0	0%
Incentive/Disincentive+	3	2	67%	1	33%	0	0%
A+B	6	4	67%	2	33%	0	0%
No Excuse Bonus+	1	1	100%	0	0%	0	0%

+ *No interpretations have been made for categories with fewer than 5 projects*

Table G-3 shows that on average projects over $20 million under all delivery systems completed with shorter time than contract duration. Meanwhile, all delivery systems showed cost overruns. A+B performed better in time (5.2% or 43.7 days) but not in cost (3.4% or $1,035,405) than Design Bid Build. Even though Design Build (Major) saved about the same amount of time (3% or 27.3 days), it reduced more cost than Design Bid Build.

Table G-3: Time and Cost Savings Analysis for Projects over $20 Million

Above $20 Million					
Project Delivery Method	Total Number of Projects	Time		Cost	
		% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	**30**	-3.0%	28.7	3.7%	$ (1,317,046)
DB (Minor)+	**3**	-0.2%	2.0	1.4%	$ (436,072)
DB (Major)	**22**	-3.0%	27.3	2.6%	$ (1,469,581)
Lump Sum+	**1**	-0.3%	2.0	-8.3%	$ 2,079,629
Incentive/Disincentive+	**3**	-7.0%	88.7	3.8%	$ (2,278,408)
A+B	**6**	-5.2%	43.7	3.4%	$ (1,035,405)
No Excuse Bonus+	**1**	-21.3%	250.0	2.6%	$ (660,372)

+ No interpretations have been made for categories with fewer than 5 projects

Table G-4 shows the breakdown of projects between $10 and $20 million based on the actual cost compared to the current contract cost. All of the projects for A+B finished with cost overruns. Incentive/Disincentive had 20% of the projects finish with cost underruns and 80% of the projects finish with cost overruns. Design Build (Major) had 25% of the projects finish with cost underruns and 75% of the projects finish with cost overruns. Design Bid Build had 33% of the projects finish with cost underruns and 67% of the projects finish with cost overruns. Lump Sum had 63% finish with cost underruns and 37% finish with cost overruns.

Table G-4: Cost Analysis for Projects between $10 and $20 Million

$10 to $20 Million							
Project Delivery Method	Total	Projects Finished with Cost Underrun		Projects Finished at Current Contract Cost		Projects Finished with Cost Overrun	
Design Bid Build	**63**	21	33%	0	0%	42	67%
DB (Minor)+	**3**	3	100%	0	0%	0	0%
DB (Major)	**12**	3	25%	0	0%	9	75%
Lump Sum	**8**	5	63%	0	0%	3	38%
Incentive/Disincentive	**5**	1	20%	0	0%	4	80%
A+B	**6**	0	0%	0	0%	6	100%
No Excuse Bonus+	**2**	1	50%	0	0%	1	50%

+ No interpretations have been made for categories with fewer than 5 projects

Table G-5 shows the breakdown of projects between $10 and $20 million based on the days used compared to the contract duration. All of the projects for A+B finished early. Incentive/Disincentive had 80% of the projects finish early and 20% finish on time. Design Build (Major) had 59% of the projects finish early, 33% finish on time, and 8% finish late. Lump Sum had 37% finish early and 63% finish on time. Design Bid Build had 40% finish early, 51% finish on time, and 9% finish late.

Table G-5: Breakdown of Early, Late, and On Time Finishes for Projects between $10 and $20 Million

$10 to $20 Million							
Project Delivery Method	**Total**	**Projects Finished Early**		**Projects Finished On Time**		**Projects Finished Late**	
Design Bid Build	**63**	25	40%	32	51%	6	9%
DB (Minor)⁺	**3**	1	33%	1	33%	1	33%
DB (Major)	**12**	7	58%	4	33%	1	8%
Lump Sum	**8**	3	38%	5	63%	0	0%
Incentive/Disincentive	**5**	4	80%	1	20%	0	0%
A+B	**6**	6	100%	0	0%	0	0%
No Excuse Bonus⁺	**2**	2	100%	0	0%	0	0%

⁺ No interpretations have been made for categories with fewer than 5 projects

Table G-6 shows an overall summary for projects between $10 and $20 million. All delivery systems finished in shorter duration than the contract duration. Meanwhile, for cost, Lump Sum saved costs while the rest had cost overruns. A+B showed the best performance in time, having a 17.1% savings (97.8 average days saved). The second best was Incentive/Disincentive with 14.7% savings (95 days). A+B, Incentive/Disincentive, Design Build (Major) with 0.5% savings (3.9 days), and Lump Sum with 4.4% (19.6 days), all performed better than Design Bid Build in this category (DBB having 0.2% or 1.4 days savings). Lump Sum (with 0.7% or $98,085 savings) showed cost underruns and had a better performance than Design Bid Build (with 1.4% or $178,909 additional spending) which had a cost overrun. Design Build (Major) with 1.5% additional costs ($209,815), Incentive/Disincentive with 5.5% additional costs ($774,658), and A+B with 4.5% additional costs ($709,287), all had cost overruns higher than traditional Design Bid Build. Overall, Lump Sum outperformed Design Bid Build on time and cost.

Table G-6: Time and Cost Savings Analysis for Projects between $10 and $20 Million

$10 to $20 Million					
Project Delivery Method	**Total Projects After Removing Dataset Outliers****	**Time**		**Cost**	
		% Change of Days Used Over Current	**Average Days Saved per Project**	**% Change of Actual Over Current Cost**	**Average Cost Saved per Project**
Design Bid Build	**63**	-0.2%	1.4	1.4%	$ (178,909)
DB (Minor)⁺	**3**	3.8%	-28.3	-1.2%	$ 136,399
DB (Major)	**12**	-0.5%	3.9	1.5%	$ (209,815)
Lump Sum	**8**	-4.4%	19.6	-0.7%	$ 98,085
Incentive/Disincentive	**5**	-14.7%	95.0	5.5%	$ (774,658)
A+B	**6**	-17.1%	97.8	4.5%	$ (709,287)
No Excuse Bonus⁺	**2**	-1.3%	10.0	-0.6%	$ 89,565

*** Please note, dataset outliers here were removed due to being erroneous and/or from terminated projects*

⁺ No interpretations have been made for categories with fewer than 5 projects

Table G-7 shows the breakdown of projects between $5 and $10 million based on the actual cost compared to the current contract cost. Incentive/Disincentive had 31% of the projects finish with cost underruns and 69% of the projects finish with cost overruns. Design Bid Build had 46% of the projects finish with cost underruns and 54% of the projects finish with cost overruns. Design Build (Major) had 60% of the projects finish with cost underruns and 40% of the projects finish with cost overruns. Lump Sum had 65% of the projects finish with cost underruns and 35% of the projects finish with cost overruns. Design Build (Minor) had 91% of the projects finish with cost underruns and 9% finish with cost overruns.

Table G-7: Cost Analysis for Projects between $5 and $10 Million

$5 to $10 Million							
Project Delivery Method	**Total**	**Projects Finished with Cost Underrun**		**Projects Finished at Current Contract Cost**		**Projects Finished with Cost Overrun**	
Design Bid Build	**135**	62	46%	0	0%	73	54%
DB (Minor)	**11**	10	91%	0	0%	1	9%
DB (Major)	**10**	6	60%	0	0%	4	40%
Lump Sum	**31**	20	65%	0	0%	11	35%
Incentive/Disincentive	**13**	4	31%	0	0%	9	69%
A+B+	**3**	0	0%	0	0%	3	100%
No Excuse Bonus+	**4**	0	0%	0	0%	4	100%

+ No interpretations have been made for categories with fewer than 5 projects

Table G-8 shows the breakdown of projects between $5 and $10 million based on the days used compared to the contract duration. Incentive/Disincentive had 77% of the projects finish early, 15% finish on time, and 8% finish late. Design Bid Build had 54% of the projects finish early, 42% finish on time, and 4% finish late. Lump Sum had 52% of the projects finish early, 42% finish on time, and 6% finish late. Design Build (Minor) had 36% projects finish early, 36% finish on time, and 27% finish late. Design Build (Major) had 30% of the projects finish early, 60% finish on time, and 10% finish late.

Table G-8: Breakdown of Early, Late, and On Time Finishes for Projects between $5 and $10 Million

$5 to $10 Million							
Project Delivery Method	**Total**	**Projects Finished Early**		**Projects Finished On Time**		**Projects Finished Late**	
Design Bid Build	**135**	72	54%	57	42%	6	4%
DB (Minor)	**11**	4	36%	4	36%	3	27%
DB (Major)	**10**	3	30%	6	60%	1	10%
Lump Sum	**31**	16	52%	13	42%	2	6%
Incentive/Disincentive	**13**	10	77%	2	15%	1	8%
A+B+	**3**	2	67%	0	0%	1	33%
No Excuse Bonus+	**4**	3	75%	1	25%	0	0%

+ No interpretations have been made for categories with fewer than 5 projects

Table G-9 shows an overall time and cost performance summary for projects between $5 and $10 million. All delivery methods except Design Build (Major) (with 0.3% or 2 additional days spent) and Design Build (Minor) (with 1.6% or 9.8 additional days spent) had shorter durations than their contract period. Meanwhile, Design Bid Build with 0.6% ($41,317) savings, Design Build (Major) with 0.6% ($42,873) savings, and Design Build (Minor) with 2% ($126,084) savings, had cost underruns. The remaining delivery systems showed cost overruns. Looking solely at time, Incentive/Disincentive (with 11.8% or 55.4 days saved) outperformed all of the delivery systems. Incentive/Disincentive and Lump Sum (with 2.1% or 5.4 days saved) performed better than the traditional Design Bid Build in time – which had 1.9% or 8.3 days saved. Both Design Build (Minor) and Design Build (Major) had overtime compared to the time savings of Design Bid Build. Looking at the cost performance, Design Build (Minor) and Design Build (Major) were the only methods that had better cost savings than Design Bid Build; and, further, Design Build (Minor) outperformed all other delivery systems on cost savings. Incentive/Disincentive (with 2.9% or $203,315 in additional spending) had significant cost overruns compared to Design Bid Build. Lump Sum had a very low cost overrun of 0.1% or $6,744. Overall, Design Bid Build was the only delivery system which saved both time and cost in this category.

Table G-9: Time and Cost Savings Analysis for Projects between $5 and $10 Million

$5 to $10 Million					
Project Delivery Method	Total Number of Projects	Time		Cost	
		% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	**135**	-1.9%	8.3	-0.6%	$ 41,317
DB (Minor)	**11**	1.6%	-9.8	-2.0%	$ 126,084
DB (Major)	**10**	0.3%	-2.0	-0.6%	$ 42,873
Lump Sum	**31**	-2.1%	5.4	0.1%	$ (6,744)
Incentive/Disincentive	**13**	-11.8%	55.4	2.9%	$ (203,315)
A+B+	**3**	-10.2%	23.3	14.9%	$ (1,168,445)
No Excuse Bonus+	**4**	-3.5%	12.3	4.0%	$ (315,778)

+ No interpretations have been made for categories with fewer than 5 projects

Table G-10 shows the breakdown of projects between $1 and $5 million based on the actual cost compared to the current contract cost. No Excuse Bonus had 60% of the projects finish with cost underruns, and 40% of the projects finish with cost overruns. Incentive/Disincentive had 61% of the projects finish with cost underruns and 39% of the projects with cost overruns. Lump Sum had 60% of the projects finish with cost underruns, 2% of projects finish at current contract cost, and 38% of the projects finish with cost overruns. A+B had 67% of the projects finish with cost underruns and 33% of the projects finish with cost overruns. Design Bid Build had 68% of the projects finish with cost underruns and 32% of the projects finish with cost overruns. Design Build (Minor) had 71% of the projects finish with cost underruns, 2% finish at current contract cost, and 27% finish with cost overruns. Design Build (Major) had 74% of the projects finish with cost underruns and 26% of the projects finish with cost overruns.

Table G-10: Cost Analysis for Projects between $1 and $5 Million

$1 to $5 Million								
Project Delivery Method	Total	Projects Finished with Cost Underrun		Projects Finished at Current Contract Cost		Projects Finished with Cost Overrun	
Design Bid Build	**658**	447	68%	1	0%	210	32%
DB (Minor)	**45**	32	71%	1	2%	12	27%
DB (Major)	**27**	20	74%	0	0%	7	26%
Lump Sum	**205**	123	60%	3	1%	79	38%
Incentive/Disincentive	**36**	22	61%	0	0%	14	39%
A+B	**6**	4	67%	0	0%	2	33%
No Excuse Bonus	**5**	3	60%	0	0%	2	40%

Table G-11 shows the breakdown of projects between $1 and $5 million based on the days used compared to the contract duration. All of the projects for No Excuse finished early. Incentive/Disincentive had 78% of the projects finish early, 14% finish on time, and 8% finish late. Design Bid Build had 52% of the projects finish early, 43% finish on time, and 5% finish late. Lump Sum had 50% of the projects finish early, 42% finish on time, and 8% finish late. Design Build (Minor) had 42% of the projects finish early, 44% finish on time, and 13% finish late. Design Build (Major) had 37% of the projects finish early, 41% of the projects finish on time, and 22% finish late. A+B had 33% finish early and 67% finish on time.

Table G-11: Breakdown of Early, Late, and On Time Finishes for Projects between $1 and $5 Million

$1 to $5 Million							
Project Delivery Method	Total	Projects Finished Early		Projects Finished On Time		Projects Finished Late	
Design Bid Build	**658**	339	52%	286	43%	33	5%
DB (Minor)	**45**	19	42%	20	44%	6	13%
DB (Major)	**27**	10	37%	11	41%	6	22%
Lump Sum	**205**	102	50%	87	42%	16	8%
Incentive/Disincentive	**36**	28	78%	5	14%	3	8%
A+B	**6**	2	33%	4	67%	0	0%
No Excuse Bonus	**5**	5	100%	0	0%	0	0%

Table G-12 shows that projects between $1 and $5 million for all delivery systems completed with shorter time than contract durations except for Design Build (Major). Meanwhile, all delivery systems saved costs except for A+B, which had cost overruns. No Excuse Bonus (with 21.3% or 55.2 days savings) outperformed all the other delivery systems on time. Incentive/Disincentive (with 8.3% or 21.8 days savings) had better time performance compared to Design Bid Build (with 2.2% or 6 days saving). Lump Sum (with 2.2% or 4.2 days savings) had similar savings compared to Design Bid Build, but Design Bid Build had better performance in days saved. Design Build (Minor) with 0.6% (2.2 days) savings and A+B with 0.2% (0.3

days) savings, had shorter durations but did not perform better than Design Bid Build. Looking at cost performance Design Bid Build had the highest cost savings in this category. Incentive/Disincentive (with 1.8% or $49,865 savings) and No Excuse Bonus (with 1.7% or $59,037 savings) did not show better performance based on percentage but saved more money than Design Bid Build (with 1.9% or $45,641 savings). The reason the percentages here do not match with the dollar amount may be because of the number of projects or the category being a cost range. A+B (with 2.2% or $50,900 additional costs) was the only delivery system which had cost overruns in this category. Overall, looking at percentages, Design Bid Build had the best performance in cost; however, looking at cost and time savings, No Excuse Bonus had the best performance in this category.

Table G-12: Time and Cost Savings Analysis for Projects between $1 and $5 Million

$1 to $5 Million					
Project Delivery Method	Total Number of Projects	Time		Cost	
		% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	**658**	-2.2%	6.0	-1.9%	$ 45,641
DB (Minor)	**45**	-0.6%	2.2	-0.5%	$ 9,831
DB (Major)	**27**	2.8%	-11.0	-1.3%	$ 30,102
Lump Sum	**205**	-2.2%	4.2	-0.2%	$ 3,871
Incentive/Disincentive	**36**	-8.3%	21.8	-1.8%	$ 49,865
A+B	**6**	-0.2%	0.3	2.2%	$ (50,900)
No Excuse Bonus	**5**	-21.3%	55.2	-1.7%	$ 59,037

Table G-13 shows the breakdown of projects under $1 million based on the days used compared to the contract duration. Incentive/Disincentive had 87% finish early and 13% finish on time. Design Build (Major) had 60% finish early, 33% finish on time, and 7% finish late. Lump Sum had 55% finish early, 38% finish on time, and 6% finish late. Design Build (Minor) had 52% finish early, 40% finish on time and 8% finish late. Design Bid Build had 50% finish early, 46% finish on time, and 4% finish late.

Table G-13: Breakdown of Early, Late, and On Time Finishes for Projects under $1 Mil.

Under $1 Million							
Project Delivery Method	Total	Projects Finished Early		Projects Finished On Time		Projects Finished Late	
Design Bid Build	**609**	304	50%	281	46%	24	4%
DB (Minor)	**85**	44	52%	34	40%	7	8%
DB (Major)	**15**	9	60%	5	33%	1	7%
Lump Sum	**357**	198	55%	137	38%	22	6%
Incentive/Disincentive	**16**	14	88%	2	13%	0	0%
A+B	**0**	-	-	-	-	-	-
No Excuse Bonus	**0**	-	-	-	-	-	-

Table G-14 shows the breakdown of projects under $1 million based on the actual cost compared to the current contract cost. The three column categories based on that comparison were Projects Finished with Cost Underrun, Projects Finished at Current Contract Cost, and Projects Finished with Cost Overrun. Incentive/Disincentive had 75% of the projects finish with cost underruns and 25% of the projects finish with cost overruns. Design Build (Minor) had 47% of the projects finish with cost underruns, 33% finish at current contract cost, and 20% finish with cost overruns. Design Build (Major) had 60% of the projects finish with cost underruns, 27% finish at current contract cost, and 13% finish with cost overruns. Design Bid Build had 87% of the projects finish with cost underruns, 2% of projects finish at current contract cost, and 11% of the projects finish with cost overruns. Lump Sum had 91% of the projects finish with cost underruns, 7% of projects finish at current contract cost, and 2% of the projects finish with cost overruns.

Table G-14: Cost Analysis for Projects under $1 Million

Under $1 Million							
Project Delivery Method	**Total**	**Projects Finished with Cost Underrun**		**Projects Finished at Current Contract Cost**		**Projects Finished with Cost Overrun**	
Design Bid Build	**609**	530	87%	9	1%	70	11%
DB (Minor)	**85**	40	47%	28	33%	17	20%
DB (Major)	**15**	9	60%	4	27%	2	13%
Lump Sum	**357**	323	90%	26	7%	8	2%
Incentive/Disincentive	**16**	12	75%	0	0%	4	25%
A+B	**0**	-	-	-	-	-	-
No Excuse Bonus	**0**	-	-	-	-	-	-

Table G-15 shows that projects under $1 million for all delivery systems completed with shorter time than contract duration, and showed cost savings. Incentive/Disincentive (with 15.2% or 21.4 days saving) had the best time performance of all the delivery systems. Design Build (Major) with 6.5% or 16.7 days savings, Design Build (Minor) with 5.2% or 9.8 days saving, and Lump Sum with 2.6% or 2.4 days savings, all performed better with time compared to Design Bid Build (having 2.1% or 3 days savings). Meanwhile, with cost, Design Bid Build (with 4.9% or $22,816 savings) outperformed all other delivery systems based on percentage. Looking at the monetary cost savings, Incentive/Disincentive (with 4.4% or $29,018 savings) outperformed all the delivery systems. The reason the percentages here do not match with the dollar amount may be because of the number of projects or the category being a cost range. All other delivery systems had cost savings: with Lump Sum having 4.3% or $14,765 savings; Design Build (Major) having 3.9% or $19,197 savings; and Design Build (Minor) having 2.6% or $9,698 savings. Overall, Incentive/Disincentive performed better than the other delivery systems in this category.

Table G-15: Time and Cost Savings Analysis for Projects under $1 Million

Under $1 Million					
Project Delivery Method	Total Number of Projects	Time		Cost	
		% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	**609**	-2.1%	3.0	-4.9%	$ 22,816
DB (Minor)	**85**	-5.2%	9.8	-2.6%	$ 9,698
DB (Major)	**15**	-6.5%	16.7	-3.9%	$ 19,197
Lump Sum	**357**	-2.6%	2.4	-4.3%	$ 14,765
Incentive/Disincentive	**16**	-15.2%	21.4	-4.4%	$ 29,018
A+B	**0**	-	-	-	-
No Excuse Bonus	**0**	-	-	-	-

Appendix H: Cost and Time Analysis with Statistical Outliers

Appendix H includes the cost and time analytical results presented without excluding statistical outliers as a benchmark for comparison, and with the excluded statistical outliers determined using both the 2 and 3 Sigma (or Standard Deviation) methods. The identified potential outliers were color coded according to the extent of influence on the results. Yellow highlights indicate that excluding the potential outlier projects substantially affected the results, but did not change the overall direction in savings or losses. Red highlights indicate a change in the direction of the results after taking out the discovered outlier projects.

Table H-1 presents the time and cost results for all delivery methods without excluding any potential outliers. Tables H-2 and H-3 revealed some changes in terms of cost and time through eliminating the identified potential outliers. Outliers were only discovered among Design Bid Build and Design Build (Major) project categories. For Design Bid Build, the time savings decreased from 28.7 days (3%) to 19.3 days (2%) by excluding one outlier project based on the 3 Sigma method. The time savings dropped to 20.2 days (2.2%) if eliminating four outliers through the 2 Sigma method. The cost savings of Design Bid Build declined from $1,317,046 (3.7%) to $1,296,898 (3.6%) after eliminating the outliers from the 3 Sigma method. And the cost savings were reduced to $1,057,038 (3.1%) eliminating four outliers through the 2 Sigma method. Regarding Design Build (Major), time savings increased slightly from 27.3 days (3%) to 28.6 days (3.1%) by excluding one outlier from the 3 Sigma method. It is Important to note that by eliminating three outlier projects, time savings dropped to 16.8 days (1.9%). Cost savings decreased from $1,469,581 (2.6%) to $1,347,184 (2.4%) and $403,785 (1.1%) after excluding the outliers identified through the 3 Sigma and 2 Sigma methods, respectively.

Table H-1: Cost and Time Analysis for Projects above $20 Million with Statistical Outliers

Above $20 Million					
With Statistical Outliers					
Project Delivery Method	Total Number of Projects	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	30	-3.0%	28.7	3.7%	$ (1,317,046)
DB (Minor)+	3	-0.2%	2.0	1.4%	$ (436,072)
DB (Major)	22	-3.0%	27.3	2.6%	$ (1,469,581)
Lump Sum+	1	-0.3%	2.0	-8.3%	$ 2,079,629
Incentive/Disincentive+	3	-7.0%	88.7	3.8%	$ (2,278,408)
A+B	6	-5.2%	43.7	3.4%	$ (1,035,405)
No Excuse Bonus+	1	-21.3%	250.0	2.6%	$ (660,372)

+ *No interpretations have been made for categories with fewer than 5 projects*

Table H-2: Cost and Time Analysis for Projects above $20 Million, Excluding the Statistical Outliers Identified by the 3 Sigma Method

Above $20 Million					
Statistical Outliers Removed (within 3 Standard Deviations)					
Project Delivery Method	Total Projects After Removing Outliers	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	29	-2.0%	19.3	3.6%	$ (1,296,898)
DB (Minor)+	3	-0.2%	2.0	1.4%	$ (436,072)
DB (Major)	21	-3.1%	28.6	2.4%	$ (1,347,184)
Lump Sum+	1	-0.3%	2.0	-8.3%	$ 2,079,629
Incentive/Disincentive+	3	-7.0%	88.7	3.8%	$ (2,278,408)
A+B	6	-5.2%	43.7	3.4%	$ (1,035,405)
No Excuse Bonus+	1	-21.3%	250.0	2.6%	$ (660,372)

+ *No interpretations have been made for categories with fewer than 5 projects*

Table H-3: Cost and Time Analysis for Projects above $20 Million, Excluding the Statistical Outliers Identified by the 2 Sigma Method

Above $20 Million					
Statistical Outliers Removed (within 2 Standard Deviations)					
Project Delivery Method	Total Projects After Removing Outliers	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	26	-2.2%	20.2	3.1%	$ (1,057,038)
DB (Minor)+	3	-0.2%	2.0	1.4%	$ (436,072)
DB (Major)	19	-1.9%	16.8	1.1%	$ (403,785)
Lump Sum+	1	-0.3%	2.0	-8.3%	$ 2,079,629
Incentive/Disincentive+	3	-7.0%	88.7	3.8%	$ (2,278,408)
A+B	6	-5.2%	43.7	3.4%	$ (1,035,405)
No Excuse Bonus+	1	-21.3%	250.0	2.6%	$ (660,372)

+ *No interpretations have been made for categories with fewer than 5 projects*

In regard to projects between $10 and $20 million, Tables H-5 and H-6 reflect a significant change in cost and time savings regarding Design Bid Build after taking out the outlier projects in comparison to Table H-4 without excluding any outliers. Specifically, it shows the cost savings of $9,142 (0.1%) changed to a loss of $178,909 (1.4%) after excluding the outlier project identified through the 3 Sigma method, and a loss of $184,231 (1.4%) after eliminating the two outlier projects highlighted by the 2 Sigma method. These are the type of outliers that require special attention from the department and a more in-depth investigation into specific project details. As such, these outlier projects are provided in Appendix K with greater detail.

Table H-4: Cost and Time Analysis for Projects between $10 and $20 Million, with Statistical Outliers

$10 to $20 Million					
With Statistical Outliers					
Project Delivery Method	Total Number of Projects	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	64	-1.0%	6.6	-0.1%	$ 9,142
DB (Minor)⁺	3	3.8%	-28.3	-1.2%	$ 136,399
DB (Major)	12	-0.5%	3.9	1.5%	$ (209,815)
Lump Sum	8	-4.4%	19.6	-0.7%	$ 98,085
Incentive/Disincentive	5	-14.7%	95.0	5.5%	$ (774,658)
A+B	6	-17.1%	97.8	4.5%	$ (709,287)
No Excuse Bonus⁺	2	-1.3%	10.0	-0.6%	$ 89,565

⁺ No interpretations have been made for categories with fewer than 5 projects

Table H-5: Cost and Time Analysis for Projects between $10 and $20 Million, Excluding the Statistical Outliers Identified by the 3 Sigma Method

$10 to $20 Million					
Statistical Outliers Removed (within 3 Standard Deviations)					
Project Delivery Method	Total Projects After Removing Outliers	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	63	-0.2%	1.4	1.4%	$ (178,909)
DB (Minor)⁺	3	3.8%	-28.3	-1.2%	$ 136,399
DB (Major)	12	-0.5%	3.9	1.5%	$ (209,815)
Lump Sum	8	-4.4%	19.6	-0.7%	$ 98,085
Incentive/Disincentive	5	-14.7%	95.0	5.5%	$ (774,658)
A+B	6	-17.1%	97.8	4.5%	$ (709,287)
No Excuse Bonus⁺	2	-1.3%	10.0	-0.6%	$ 89,565

⁺ No interpretations have been made for categories with fewer than 5 projects

Table H-6: Cost and Time Analysis for Projects between $10 and $20 Million, Excluding the Statistical Outliers Identified by the 2 Sigma Method

$10 to $20 Million					
Statistical Outliers Removed (within 2 Standard Deviations)					
Project Delivery Method	Total Projects After Removing Outliers	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	62	-1.1%	7.5	1.4%	$ (184,231)
DB (Minor) +	3	3.8%	-28.3	-1.2%	$ 136,399
DB (Major)	12	-0.5%	3.9	1.5%	$ (209,815)
Lump Sum	8	-4.4%	19.6	-0.7%	$ 98,085
Incentive/Disincentive	5	-14.7%	95.0	5.5%	$ (774,658)
A+B	6	-17.1%	97.8	4.5%	$ (709,287)
No Excuse Bonus+	2	-1.3%	10.0	-0.6%	$ 89,565

+ *No interpretations have been made for categories with fewer than 5 projects*

Tables H-8 and H-9 show a drastic change in terms of cost with the projects between $5 and $10 million using Lump Sum, which turned from a cost overrun of $6,744 (0.1%) to cost savings of $34,786 (-0.5%) after excluding two outlier projects highlighted by the 2 and 3 Sigma methods in Table H-7. As a result, those two projects deserve some additional inspection on the part of FDOT engineers for future practice. Regarding time, Lump Sum time savings decreased slightly from 5.4 days (2.1%) to 3.9 days (1.5%) after exclusion of the outliers. Design Bid Build showed a significant change in cost savings from $78,719 (1.1%) to $2,416 after exclusion of two outlier projects identified by the 3 Sigma method. However, cost savings of Design Bid Build rebounded to $16,364 (0.2%) after exclusion of two projects identified as outliers by the 2 Sigma method, indicating certain attention should be given by the FDOT to those two projects in order to provide useful information for future practice. The time delay dropped to 6.5 days (1.5%) and 6.3 days (1.4%) from 10.4 days (2.3%) after exclusion of the outliers.

Table H-7: Cost and Time Analysis for Projects between $5 and $10 Million, with Statistical Outliers

$5 to $10 Million					
With Statistical Outliers					
Project Delivery Method	Total Number of Projects	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	136	-2.3%	10.4	-1.1%	$ 78,719
DB (Minor)	11	1.6%	-9.8	-2.0%	$ 126,084
DB (Major)	10	0.3%	-2.0	-0.6%	$ 42,873
Lump Sum	31	-2.1%	5.4	0.1%	$ (6,744)
Incentive/Disincentive	13	-11.8%	55.4	2.9%	$ (203,315)
A+B+	3	-10.2%	23.3	14.9%	$ (1,168,445)

No Excuse Bonus+	4	-3.5%	12.3	4.0%	$ (315,778)

+ *No interpretations have been made for categories with fewer than 5 projects*

Table H-8: Cost and Time Analysis for Projects between $5 and $10 Million, Excluding the Statistical Outliers Identified by the 3 Sigma Method

$5 to $10 Million					
Statistical Outliers Removed (within 3 Standard Deviations)					
Project Delivery Method	Total Projects After Removing Outliers	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	134	-1.5%	6.5	-0.03%	$ 2,416
DB (Minor)	11	1.6%	-9.8	-2.0%	$ 126,084
DB (Major)	10	0.3%	-2.0	-0.6%	$ 42,873
Lump Sum	29	-1.5%	3.9	-0.5%	$ 34,786
Incentive/Disincentive	13	-11.8%	55.4	2.9%	$ (203,315)
A+B+	3	-10.2%	23.3	14.9%	$ (1,168,445)
No Excuse Bonus+	4	-3.5%	12.3	4.0%	$ (315,778)

+ *No interpretations have been made for categories with fewer than 5 projects*

Table H-9: Cost and Time Analysis for Projects between $5 and $10 Million, Excluding the Statistical Outliers Identified by the 2 Sigma Method

$5 to $10 Million					
Statistical Outliers Removed (within 2 Standard Deviations)					
Project Delivery Method	Total Projects After Removing Outliers	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Amount	Average Cost Saved per Project
Design Bid Build	132	-1.4%	6.3	-0.2%	$ 16,364
DB (Minor)	11	1.6%	-9.8	-2.0%	$ 126,084
DB (Major)	10	0.3%	-2.0	-0.6%	$ 42,873
Lump Sum	29	-1.5%	3.9	-0.5%	$ 34,786
Incentive/Disincentive	12	-10.2%	47.0	2.2%	$ (149,910)
A+B+	3	-10.2%	23.3	14.9%	$ (1,168,445)
No Excuse Bonus+	4	-3.5%	12.3	4.0%	$ (315,778)

+ *No interpretations have been made for categories with fewer than 5 projects*

For projects between $1 and $5 million, Table H-10 shows that a large number of outlier projects were spotted with regard to most delivery methods. It is noticeable that Design Build (Major) projects turned from a time savings of 11 days (2.8%) to a time delay of 4.3 days (-1.1%) after excluding the outliers identified by the 2 Sigma method (Table H-12). Nevertheless, there is a slight change in time savings to 6 days (1.5%) by eliminating the outlier screened by the 3 Sigma approach (Table H-11). Design Bid Build revealed a change in time delays from 6 days (2.2%) to 5.2 days (1.9%) and to 3.9 days (1.4%) through filtering the outliers by the 3 and 2 Sigma methods, respectively. Design Bid Build also showed a slim change in cost savings from $45,641 (1.9%) to $35,326 (1.4%) and to $29,647(1.2%) after exclusion of the outliers identified by the 3 and 2 Sigma methods, respectively. Time savings of Design Build (Minor) increased slightly from 2.2 days (0.6%) to 2.7 days (0.7%) and decreased to 0.4 days (0.1%) after exclusion of the 3 and 3 Sigma outliers, respectively. Cost savings of Design Build (Minor) dropped from $45,641 (1.9%) to $35,326 (1.4%) and to $29,647 (1.2%) after exclusion of the 3 and 2 Sigma outliers, respectively. As for Lump Sum, time increased from 4.7 days (2.5%) to 5 days (2.7%) and 5.2 days (2.8%) after exclusion of the 3 and 2 Sigma outliers, respectively. Cost overruns decreased first from $17,973 (0.8%) to $2,432 (0.1%) and then rebounded slightly to $5,894 (0.3%). Concerning Incentive/Disincentive, time delays increased from 21.8 days (8.3%) to 22.3 days (8.4%) and to 28.3 days (10.9%). Cost savings increased from $49,865 (1.8%) to $66,195(2.4%) and to $55,265 (1.9%).

Table H-10: Cost and Time Analysis for Projects between $1 and $5 Million, with Statistical Outliers

$1 to $5 Million					
With Statistical Outliers					
Project Delivery Method	Total Number of Projects	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	658	-2.2%	6.0	-1.9%	$ 45,641
DB (Minor)	45	-0.6%	2.2	-0.5%	$ 9,831
DB (Major)	27	2.8%	-11.0	-1.3%	$ 30,102
Lump Sum	206	-2.5%	4.7	-0.8%	$ 17,973
Incentive/Disincentive	36	-8.3%	21.8	-1.8%	$ 49,865
A+B	6	-0.2%	0.3	2.2%	$ (50,900)
No Excuse Bonus	5	-21.3%	55.2	-1.7%	$ 59,037

Table H-11: Cost and Time Analysis for Projects between $1 and $5 Million, Excluding the Statistical Outliers Identified by the 3 Sigma Method

$1 to $5 Million					
Statistical Outliers Removed (within 3 Standard Deviations)					
Project Delivery Method	Total Projects After Removing Outliers	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	633	-1.9%	5.2	-1.4%	$ 35,326
DB (Minor)	43	-0.7%	2.7	-0.5%	$ 11,544
DB (Major)	26	1.5%	-6.0	-1.2%	$ 27,976
Lump Sum	203	-2.7%	5.0	-0.1%	$ 2,432
Incentive/Disincentive	35	-8.4%	22.3	-2.4%	$ 66,196
A+B	6	-0.2%	0.3	2.2%	$ (50,900)
No Excuse Bonus	5	-21.3%	55.2	-1.7%	$ 59,037

Table H-12: Cost and Time Analysis for Projects between $1 and $5 Million, Excluding the Statistical Outliers Identified by the 2 Sigma Method

$1 to $5 Million					
Statistical Outliers Removed (within 2 Standard Deviations)					
Project Delivery Method	Total Projects After Removing Outliers	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	607	-1.4%	3.9	-1.2%	$ 29,647
DB (Minor)	39	-0.1%	0.4	-0.9%	$ 19,773
DB (Major)	21	-1.1%	4.3	-1.5%	$ 35,341
Lump Sum	196	-2.8%	5.2	-0.3%	$ 5,894
Incentive/Disincentive	31	-10.9%	28.3	-1.9%	$ 55,265
A+B	6	-0.2%	0.3	2.2%	$ (50,900)
No Excuse Bonus	5	-21.3%	55.2	-1.7%	$ 59,037

With respect to projects under $1 million, a series of outliers were discovered for the Design Bid Build and Lump Sum delivery methods as shown in Tables H-13, H-14, and H-15. Nevertheless, Design Build (Minor) saw a decrease in time savings from 9.8 days (5.2%) to 7.7 days (4.06%) and then further to 5 days (2.6%) without the outliers. Design Build (Major) also experienced a plunge in time savings from 16.7 days (6.5%) to 8.8 days (3.5%) by excluding the outliers discovered by the 2 Sigma method (Table H-15). Despite there not being a change in time savings to Incentive/Disincentive, cost savings jumped from $29,018 (4.4%) to $35,083 (5.3%) without the outliers identified by the 2 Sigma approach. In addition, cost savings of Design Bid Build slightly increased from $22,816 (4.9%) to $23,178 (4.95%) and to $24,002 (5.1%) after eliminating the outliers highlighted by the 3 and 2 Sigma approaches. It is interesting that time savings increased from 2.4 days (2.6%) to 2.6 days (2.77%) and then declined to 2 days (2.1%) after exclusion of outliers identified by the 3 and 2 Sigma methods, respectively.

Table H-13: Cost Analysis for Projects under $1 Million, with Statistical Outliers

Under $1 Million					
With Statistical Outliers					
Project Delivery Method	Total Number of Projects	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	609	-2.1%	3.0	-4.9%	$ 22,816
DB (Minor)	85	-5.2%	9.8	-2.6%	$ 9,698
DB (Major)	15	-6.5%	16.7	-3.9%	$ 19,197
Lump Sum	357	-2.6%	2.4	-4.3%	$ 14,765
Incentive/Disincentive	16	-15.2%	21.4	-4.4%	$ 29,018
A+B	0	-	-	-	-

No Excuse Bonus	0	-	-	-	-

Table H-14: Cost and Time Analysis for Projects under $1 Million, Excluding the Statistical Outliers Identified by the 3 Sigma Method

Under $1 Million					
Statistical Outliers Removed (within 3 Standard Deviations)					
Project Delivery Method	Total Projects After Removing Outliers	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	599	-2.27%	3.2	-4.95%	$ 23,178
DB (Minor)	82	-4.06%	7.7	-2.35%	$ 8,827
DB (Major)	15	-6.52%	16.7	-3.94%	$ 19,197
Lump Sum	349	-2.77%	2.6	-4.28%	$ 14,898
Incentive/Disincentive	16	-15.18%	21.4	-4.36%	$ 29,018
A+B	0	-	-	-	-
No Excuse Bonus	0	-	-	-	-

Table H-15: Cost and Time Analysis for Projects under $1 Million, Excluding the Statistical Outliers Identified by the 2 Sigma Method

Under $1 Million					
Statistical Outliers Removed (within 2 Standard Deviations)					
Project Delivery Method	Total Projects After Removing Outliers	% Change of Days Used Over Current	Average Days Saved per Project	% Change of Actual Over Current Cost	Average Cost Saved per Project
Design Bid Build	556	-1.7%	2.4	-5.1%	$ 24,002
DB (Minor)	76	-2.6%	5.0	-2.4%	$ 9,239
DB (Major)	14	-3.5%	8.8	-3.7%	$ 18,249
Lump Sum	315	-2.1%	2.0	-4.4%	$ 15,401
Incentive/Disincentive	14	-14.5%	21.4	-5.3%	$ 35,083
A+B	0	-	-	-	-
No Excuse Bonus	0	-	-	-	-

Appendix I: Cost and Time Analysis Performance by Cost Category

Appendix I includes detailed cost and time performance conclusions.

Time and Cost Performance for Projects Above $20 Million

From Figures I-1 and I-2, although Design Bid Build outperformed Lump Sum in terms of time savings, it increased project cost as opposed to cost savings for Lump Sum. No Excuse Bonus and A+B saved greatly more time than Design Bid Build, at the same time they increased less cost than Design Bid Build. Incentive/Disincentive saved more time but increased more cost than Design Bid Build. Design Build (Major) and Design Build (Minor) saved less time than Design Bid Build, meanwhile, they increased cost.

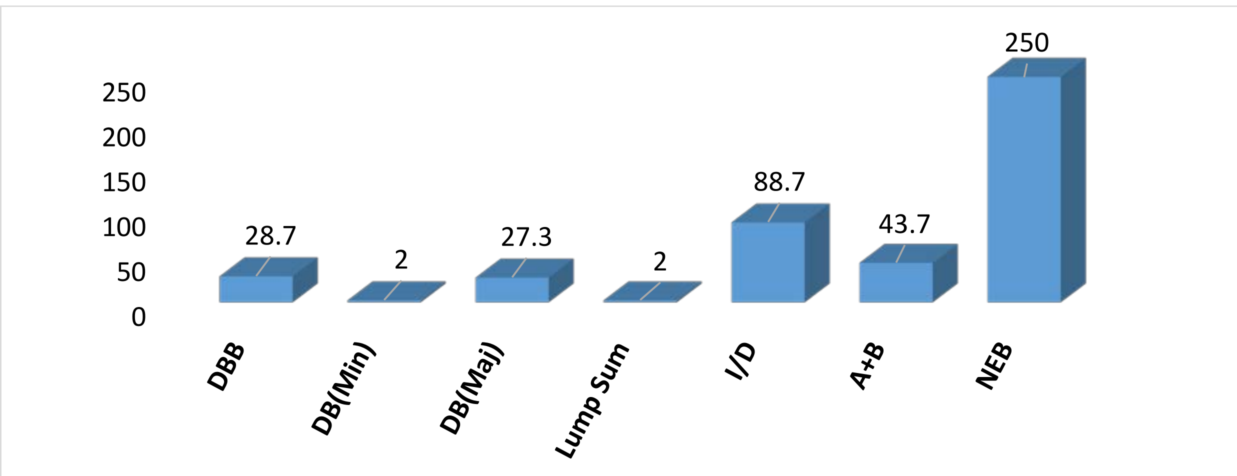

Figure I-1: Time Performance for Projects above $20 Million per Delivery System

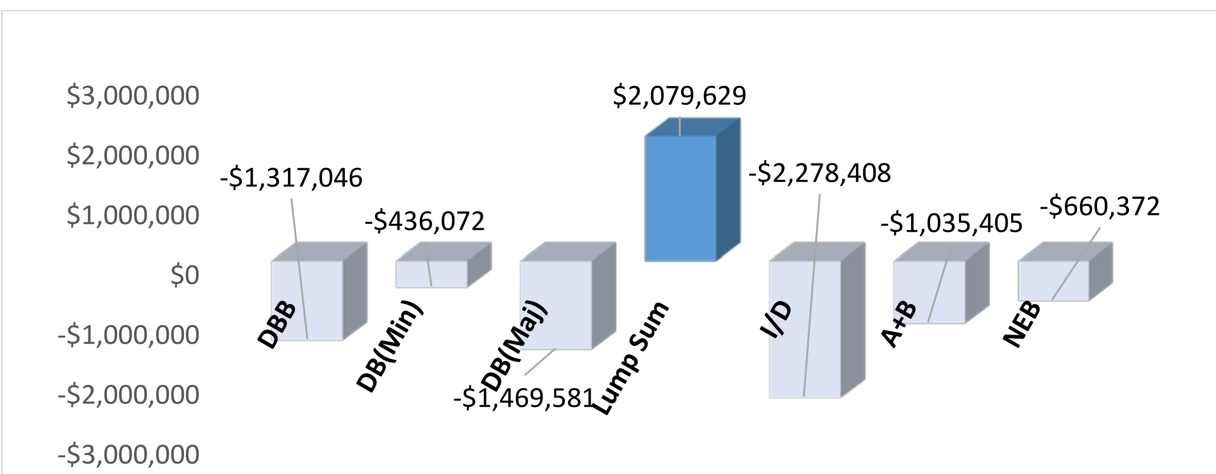

Figure I-2: Cost Performance for Projects above $20 Million per Delivery System

Time and Cost Performance for Projects Between $10 and $20 Million

From Figures I-3 and I-4, with the exception of Design Build (Minor), which caused time delays, other alternative delivery systems performed much better than Design Bid Build in terms of time savings. It is interesting that Lump Sum and No Excuse Bonus can save time as well as cost. Incentive/Disincentive and A+B reduced a tremendous amount of time while simultaneously increasing a considerable amount of cost. Hence, deciding which delivery system to use is entirely dependent on whether time is of essence or cost is more important for specific projects.

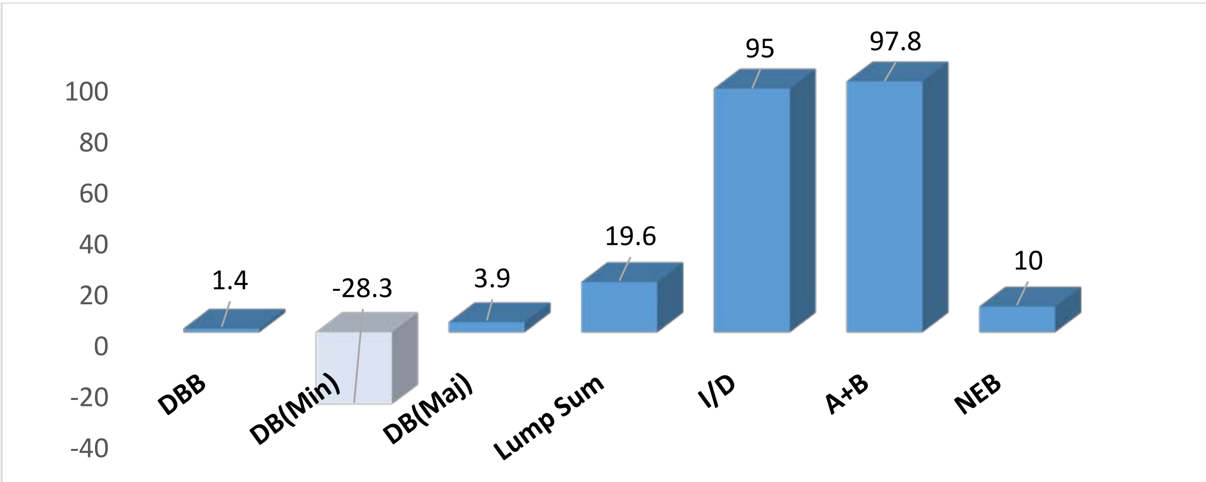

Figure I-3: Time Performance for Projects between $10 and $20 Million per Delivery System

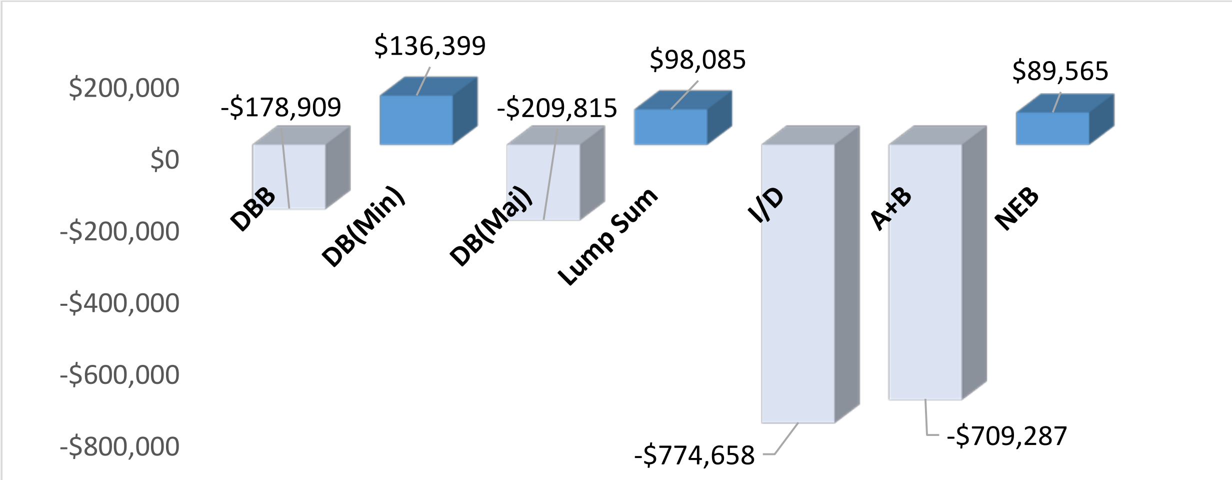

Figure I-4: Cost Performance for Projects between $10 and $20 Million per Delivery System

Time and Cost Performance for Projects Between $5 and $10 Million

It is shown in Figures I-5 and I-6 that Design Bid Build decreased both cost and time. While Incentive/Disincentive, A+B, and No Excuse Bonus performed better in time savings than Design Build Bid, they greatly increased project cost. Lump Sum slightly reduced project time, but increased project cost. On the contrary, Design Build (Major) and Design Build (Minor) saved project cost even though they caused time delays.

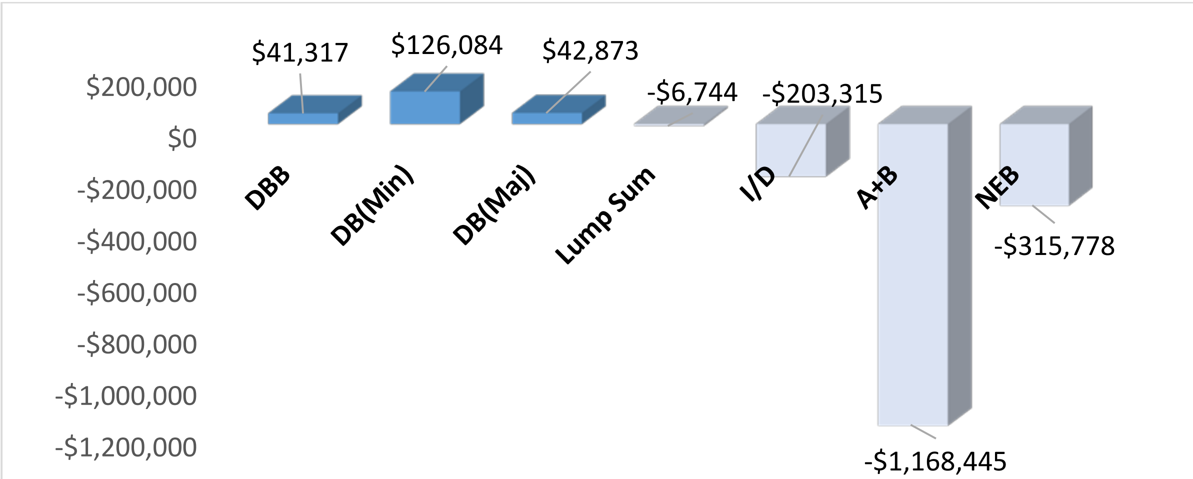

Figure I-5: Time Performance for Projects between $5 and $10 Million per Delivery System

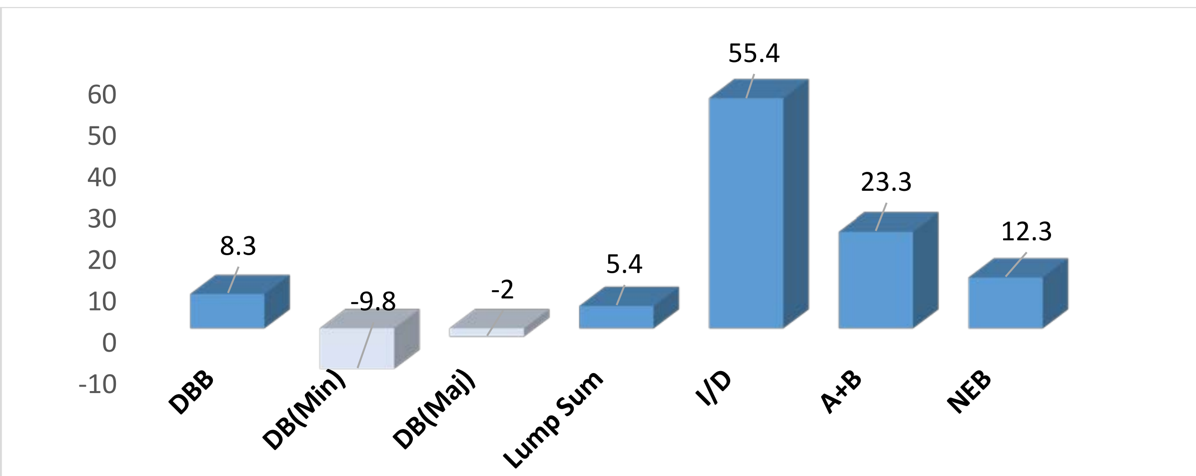

Figure I-6: Cost Performance for Projects between $5 and $10 Million per Delivery System

<u>**Time and Cost Performance for Projects Between $1 and $5 Million**</u>

As illustrated on Figures I-7 and I-8, all delivery systems, except for Design Build (Major), resulted in cost project delays. No Excuse Bonus and Incentive/Disincentive saved more cost than Design Bid Build, in spite of the fact that No Excuse Bonus led to more time delay than Design Bid Build.

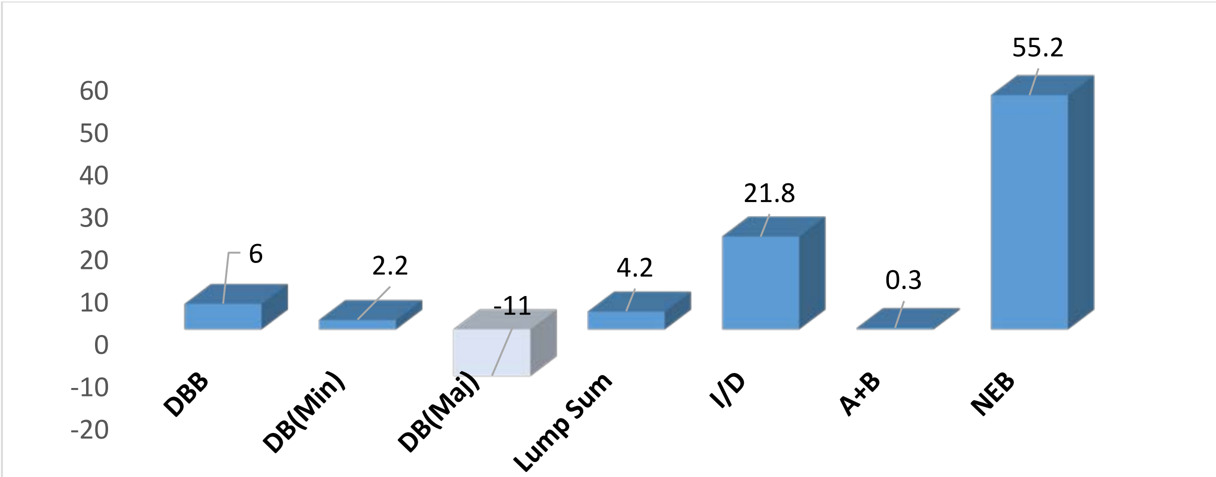

Figure I-7: Time Performance for Projects between $1 and $5 Million per Delivery System

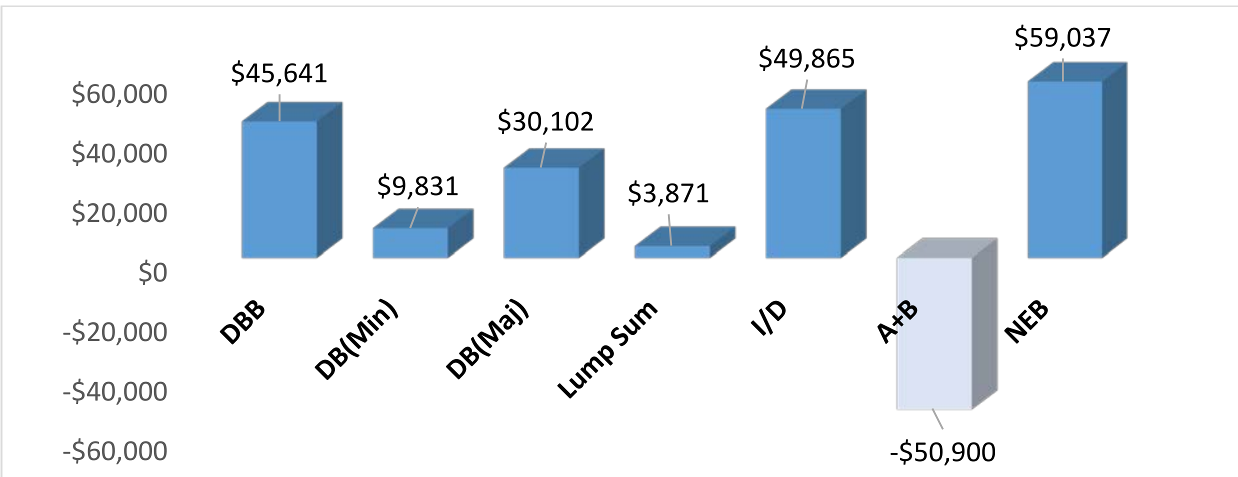

Figure I-8: Cost Performance for Projects between $1 and $5 Million per Delivery System

Time and Cost Performance for Projects Under $1 Million

Looking at Figures I-9 and I-10, A+B and No Excuse Bonus were not applicable in analysis due to the lack of data. It is interesting that all the delivery systems saved cost and time. Design Build (Major), Design Build (Minor), and Incentive/Disincentive outperformed Design Bid Build in terms of time savings. Furthermore, Incentive/Disincentive reduced more cost than Design Bid Build. The outstanding performance in time and cost savings for this category is likely attributed to the size of the projects, which are easier to manage and control during project execution than larger projects.

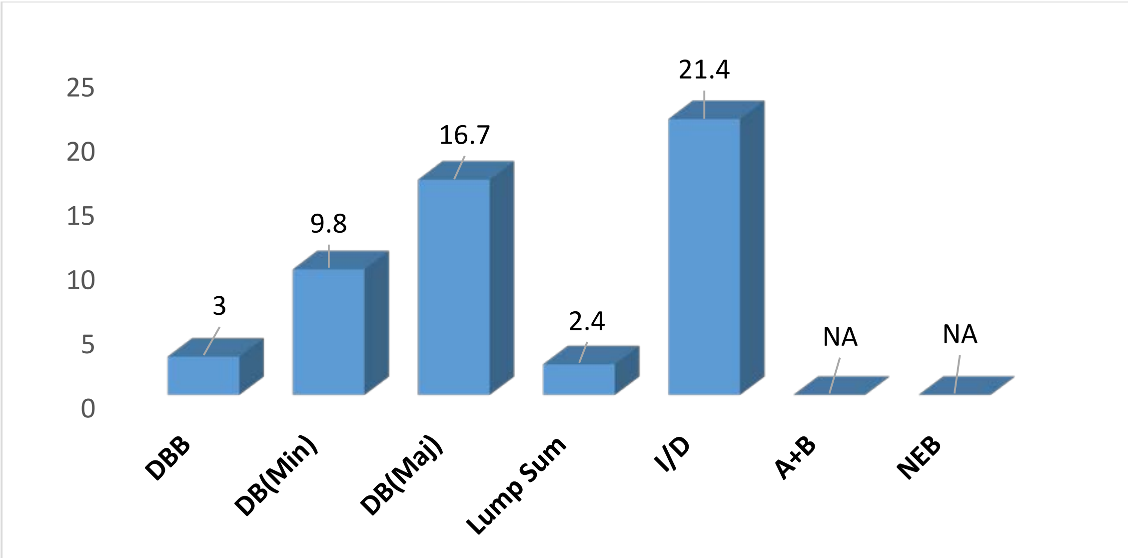

Figure I-9: Time Performance for Projects under $1 Million per Delivery System

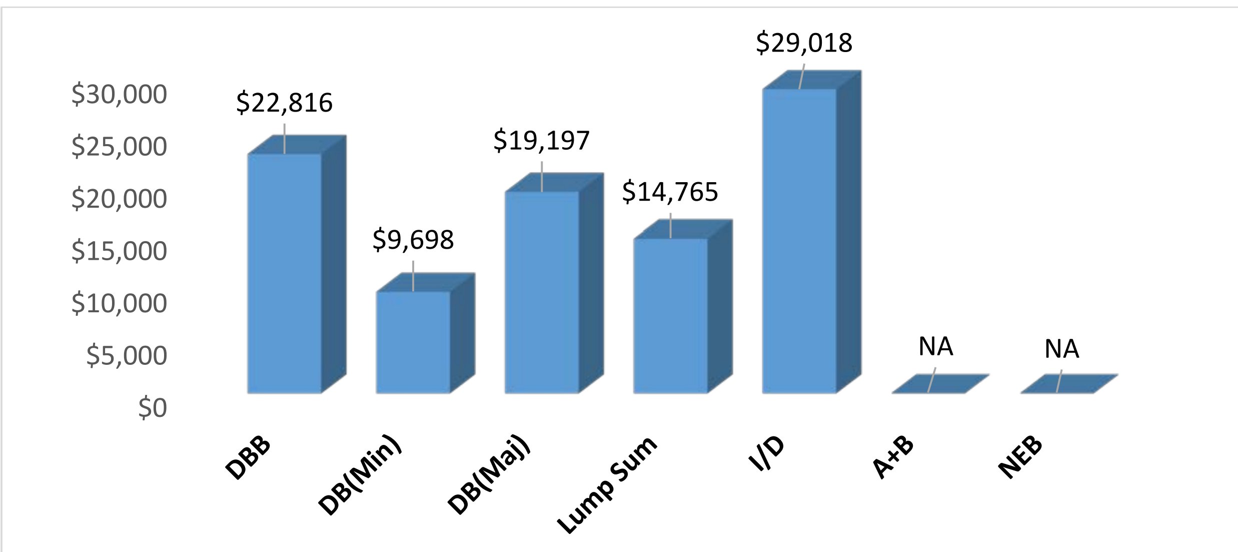

Figure I-10: Cost Performance for Projects under $1 Million per Delivery System

Appendix J: Comprehensive Time and Cost Data

Appendix J includes the comprehensive time and cost data for each cost category as broken out by project delivery method.

Above $20 Million
Time Data

Table J-1: Time Data for Design Bid Build above $20 Million

Design Bid Build										
TIME										
District	**Projects Finished Early**	**% Change of Days Used Over Current**	**Average Days Saved per Project**	**Projects Finished On Time**	**Projects Finished Late**	**% Change of Days Used Over Current**	**Average Days Saved per Project**	**Total**	**% Change of Days Used Over Current**	**Average Days Saved per Project**
1	0	-	-	1	1	19.17%	-202.00	2	10.48%	-101.00
2	4	-3.46%	35.00	2	0	-	-	6	-2.25%	23.33
3	3	-0.89%	10.67	2	0	-	-	5	-0.61%	6.40
4	1	-3.30%	35.00	0	0	-	-	1	-3.30%	35.00
5	1	-7.24%	33.00	0	0	-	-	1	-7.24%	33.00
7	2	-12.14%	119.50	3	0	-	-	5	-5.29%	47.80
8	6	-11.55%	97.33	3	1	0.12%	-1.00	10	-6.34%	58.30
overall	**17**	**-6.57%**	**62.53**	**11**	**2**	**10.58%**	**-101.50**	**30**	**-3.00%**	**28.67**

Table J-2: Time Data for Design Build (Minor) above $20 Million

Design Build (Minor)										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
5	2	-0.17%	1.5	0	0	-	-	2	-0.17%	1.5
7	1	-0.24%	3	0	0	-	-	1	-0.24%	3
overall	**3**	**-0.20%**	**2**	**0**	**0**	**-**	**-**	**3**	**-0.20%**	**2**

Table J-3: Time Data for Design Build (Major) above $20 Million

Design Build (Major)										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	2	-8.65%	86.5	2	0	-	-	4	-4.67%	43.25
2	1	-0.11%	1	1	0	-	-	2	-0.05%	0.5
4	3	-7.68%	77.67	2	0	-	-	5	-4.39%	46.6
5	3	-4.97%	39.67	2	0	-	-	5	-3.21%	23.8
6	1	-6.36%	73	0	0	-	-	1	-6.36%	73
7	1	-0.13%	1	0	0	-	-	1	-0.13%	1
8	0	-	-	4	0	-	-	4	0.00%	0
overall	**11**	**-5.86%**	**54.55**	**11**	**0**	**-**	**-**	**22**	**-3.03%**	**27.27**

Table J-4: Time Data for Lump Sum above $20 Million

Lump Sum										
TIME										
District	**Projects Finished Early**	**% Change of Days Used Over Current**	**Average Days Saved per Project**	**Projects Finished On Time**	**Projects Finished Late**	**% Change of Days Used Over Current**	**Average Days Saved per Project**	**Total**	**% Change of Days Used Over Current**	**Average Days Saved per Project**
7	1	-0.32%	2	0	0	-	-	1	-0.32%	2
overall	**1**	**-0.32%**	**2**	**0**	**0**	**-**	**-**	**1**	**-0.32%**	**2**

Table J-5: Time Data for Incentive/Disincentive above $20 Million

Incentive/Disincentive										
TIME										
District	**Projects Finished Early**	**% Change of Days Used Over Current**	**Average Days Saved per Project**	**Projects Finished On Time**	**Projects Finished Late**	**% Change of Days Used Over Current**	**Average Days Saved per Project**	**Total**	**% Change of Days Used Over Current**	**Average Days Saved per Project**
4	1	-9.44%	140	1	0	-	-	2	-6.15%	70
6	1	-8.25%	126	0	0	-	-	1	-8.25%	126
overall	**2**	**-8.83%**	**133**	**1**	**0**	**-**	**-**	**3**	**-6.99%**	**88.67**

Table J-6: Time Data for A+B above $20 Million

A+B										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
5	2	-8.75%	80.5	1	0	-	-	3	-6.33%	53.67
6	0	-	-	1	0	-	-	1	0.00%	0
7	2	-6.04%	50.5	0	0	-	-	2	-6.04%	50.5
overall	**4**	**-7.46%**	**65.5**	**2**	**0**	**-**	**-**	**6**	**-5.22%**	**43.67**

Table J-7: Time Data for No Excuse Bonus above $20 Million

No Excuse Bonus										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
4	1	-21.33%	250	0	0	-	-	1	-21.33%	250
overall	**1**	**-21.33%**	**250**	**0**	**0**	**-**	**-**	**1**	**-21.33%**	**250**

Above $20 Million
Cost Data

Table J-8: Cost Data for Design Bid Build above $20 Million

Design Bid Build										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	0	-	-	0	2	2.10%	-655,978.29	2	2.10%	-655,978.29
2	0	-	-	0	6	5.26%	-1,978,299.41	6	5.26%	-1,978,299.41
3	1	-0.33%	116,397.06	0	4	2.86%	-677,535.17	5	1.99%	-518,748.73
4	1	-0.45%	132,386.58	0	0	-	-	1	-0.45%	132,386.58
5	0	-	-	0	1	5.11%	-1,274,842.38	1	5.11%	-1,274,842.38
7	3	-2.52%	1,004,615.39	0	2	3.56%	-964,153.53	5	-0.62%	217,107.82
8	2	-2.01%	437,975.13	0	8	6.27%	-3,069,365.76	10	5.44%	-2,367,897.59
overall	**7**	**-1.81%**	**591,225.72**	**0**	**23**	**5.11%**	**-1,897,824.75**	**30**	**3.65%**	**-1,317,046.31**

Table J-9: Cost Data for Design Build (Minor) above $20 Million

Design Build (Minor)										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
5	0	-	-	0	2	1.92%	-550,684.42	2	1.92%	-550,684.42
7	0	-	-	0	1	0.55%	-206,848.24	1	0.55%	-206,848.24
overall	**0**	**-**	**-**	**0**	**3**	**1.38%**	**-436,072.36**	**3**	**1.38%**	**-436,072.36**

Table J-10: Cost Data for Design Build (Major) above $20 Million

Design Build (Major)										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	2	-0.67%	154,584.56	0	2	4.38%	-10,362,159.59	4	3.93%	-5,103,787.51
2	1	-0.08%	26,045.24	0	1	4.58%	-1,285,820.14	2	2.13%	-629,887.45
4	2	-0.57%	161,586.56	0	3	1.79%	-853,815.80	5	1.12%	-447,654.86
5	3	-0.53%	179,181.70	0	2	2.06%	-475,888.11	5	0.28%	-82,846.23
6	0	-	-	0	1	2.43%	-2,698,934.12	1	2.43%	-2,698,934.12
7	1	-0.16%	100,506.18	0	0	-	-	1	-0.16%	100,506.18
8	0	-	-	0	4	4.39%	-1,351,233.65	4	4.39%	-1,351,233.65
overall	**9**	**-0.43%**	**144,048.75**	**0**	**13**	**3.64%**	**-2,586,710.13**	**22**	**2.64%**	**-1,469,581.5**

Table J-11: Cost Data for Lump Sum above $20 Million

Lump Sum										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
7	1	-8.27%	2,079,628.90	0	0	-	-	1	-8.27%	2,079,628.94
overall	**1**	**-8.27%**	**2,079,628.90**	**0**	**0**	**-**	**-**	**1**	**-8.27%**	**2,079,628.94**

Table J-12: Cost Data for Incentive/Disincentive above $20 Million

Incentive/Disincentive										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
4	1	-5.18%	1,044,647.14	0	1	-	-	2	-0.18%	57,391.85
6	0	-	-	0	1	5.90%	-6,950,006.88	1	5.90%	-6,950,006.88
overall	**1**	**-5.18%**	**1,044,647.14**	**0**	**2**	**4.87%**	**-3,939,935.16**	**3**	**3.76%**	**-2,278,407.73**

Table J-13: Cost Data for A+B above $20 Million

A+B										
COST										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
5	2	-0.11%	5940.45	1	0	-	-	3	4.52%	-1581001.30
6	0	-	-	0	1	5.76%	-1217435.30	1	5.76%	-1217435.30
7	1	-1.20%	243331.19	0	1	1.37%	-495319.06	2	0.45%	-125993.93
overall	**3**	**-0.83%**	**85070.70**	**1**	**2**	**2.98%**	**-856377.19**	**6**	**3.40%**	**-1035404.5**

Table J-14: Cost Data for No Excuse Bonus above $20 Million

No Excuse Bonus										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
4	0	-	-	0	1	2.63%	-660371.62	1	2.63%	-660371.62
overall	**0**	**-**	**-**	**0**	**1**	**2.63%**	**-660371.62**	**1**	**2.63%**	**-660371.62**

$10 to $20 Million
Time Data

Table J-15: Time Data for Design Bid Build between $10 and $20 Million

Design Bid Build										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	2	-0.26%	2	6	1	6.32%	-60	9	0.84%	-6.22
2	10	-2.14%	13.8	6	3	20.97%	-129.67	19	2.15%	-13.21
3	3	-11.67%	68.33	4	0	-	-	7	-3.86%	29.29
4	4	-2.89%	26.25	2	0	-	-	6	-2.12%	17.5
5	2	-3.13%	20	0	0	-	-	2	-3.13%	20
6	0	-	-	3	2	2.34%	-19	5	1.03%	-7.6
7	1	-3.48%	11	5	0	-	-	6	-0.26%	1.83
8	3	-4.25%	24.67	6	0	-	-	9	-1.43%	8.22
overall	**25**	**-3.46%**	**23.08**	**32**	**6**	**11.00%**	**-81.17**	**63**	**-0.21%**	**1.43**

Table J-16: Time Data for Design Build (Minor) between $10 and $20 Million

Design Build (Minor)										
TIME										
District	**Projects Finished Early**	**% Change of Days Used Over Current**	**Average Days Saved per Project**	**Projects Finished On Time**	**Projects Finished Late**	**% Change of Days Used Over Current**	**Average Days Saved per Project**	**Total**	**% Change of Days Used Over Current**	**Average Days Saved per Project**
4	0	-	-	0	1	6.70%	-86	1	6.70%	-86
5	1	-0.22%	1	0	0	-	-	1	-0.22%	1
7	0	-	-	1	0	-	-	1	0.00%	0
overall	**1**	**-0.22%**	**1**	**1**	**1**	**6.70%**	**-86**	**3**	**3.78%**	**-28.33**

Table J-17: Time Data for Design Build (Major) between $10 and $20 Million

Design Build (Major)										
TIME										
District	**Projects Finished Early**	**% Change of Days Used Over Current**	**Average Days Saved per Project**	**Projects Finished On Time**	**Projects Finished Late**	**% Change of Days Used Over Current**	**Average Days Saved per Project**	**Total**	**% Change of Days Used Over Current**	**Average Days Saved per Project**
1	0	-	-	0	1	5.43%	-51	1	5.43%	-51
2	0	-	-	2	0	-	-	2	0.00%	0
4	4	-0.29%	2.25	0	0	-	-	4	-0.29%	2.25
5	2	-1.18%	6.5	1	0	-	-	3	-0.68%	4.33
8	1	-12.28%	76	1	0	-	-	2	-5.58%	38
overall	**7**	**-2.03%**	**14**	**4**	**1**	**5.43%**	**-51**	**12**	**-0.54%**	**3.92**

Table J-18: Time Data for Lump Sum between $10 and $20 Million

Lump Sum										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	2	-14.86%	65	0	0	-	-	2	-14.86%	65
2	1	-9.64%	27	2	0	-	-	3	-2.76%	9
4	0	-	-	3	0	-	-	3	0.00%	0
overall	**3**	**-13.59%**	**52.33**	**5**	**0**	**-**	**-**	**8**	**-4.45%**	**19.63**

Table J-19: Time Data for Incentive/Disincentive between $10 and $20 Million

Incentive/Disincentive										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	1	-12.47%	57	0	0	-	-	1	-12.47%	57
4	0	-	-	1	0	-	-	1	0.00%	0
5	1	-28.87%	192	0	0	-	-	1	-28.87%	192
6	2	-18.49%	113	0	0	-	-	2	-18.49%	113
overall	**4**	**-20.26%**	**118.75**	**1**	**0**	**-**	**-**	**5**	**-14.68%**	**95**

Table J-20: Time Data for A+B between $10 and $20 Million

A+B										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	2	-9.42%	49	0	0	-	-	2	-9.42%	49
3	1	-20.50%	107	0	0	-	-	1	-20.50%	107
5	3	-20.46%	127.33	0	0	-	-	3	-20.46%	127.33
overall	**6**	**-17.12%**	**97.83**	**0**	**0**	**-**	**-**	**6**	**-17.12%**	**97.83**

Table J-21: Time Data for No Excuse Bonus between $10 and $20 Million

No Excuse Bonus										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
4	2	-1.32%	10	0	0	-	-	2	-1.32%	10
overall	**2**	**-1.32%**	**10**	**0**	**0**	**-**	**-**	**2**	**-1.32%**	**10**

$10 to $20 Million
Cost Data

Table J-22: Cost Data for Design Bid Build between $10 and $20 Million

Design Bid Build										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	3	-2.04%	307,291.12	0	6	4.06%	-521,444.61	9	1.81%	-245,199.36
2	3	-2.77%	323,177.35	0	16	3.68%	-466,027.58	19	2.73%	-341,416.27
3	1	-15.81%	1,822,215.22	0	6	4.59%	-647,494.06	7	2.14%	-294,678.44
4	2	-6.04%	687,111.36	0	4	2.87%	-377,859.71	6	0.18%	-22,869.35
5	0	-	-	0	2	4.27%	-562,682.74	2	4.27%	-562,682.74
6	4	-3.88%	471,192.92	0	1	0.11%	-18,534.04	5	-2.84%	373,247.53
7	3	-3.76%	543,682.44	0	3	7.28%	-919,453.45	6	1.39%	-187,885.51
8	5	-3.68%	488,357	0	4	3.90%	-608,240.55	9	-0.01%	980.31
overall	**21**	**-4.05%**	**525,973.68**	**0**	**42**	**3.98%**	**-531,350.81**	**63**	**1.35%**	**-178,909.31**

Table J-23: Cost Data for Design Build (Minor) between $10 and $20 Million

Design Build (Minor)										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
4	1	-2.34%	243,671.99	0	0	-	-	1	-2.34%	243,671.99
5	1	-0.48%	49,472.37	0	0	-	-	1	-0.48%	49,472.37
7	1	-0.79%	116,053.15	0	0	-	-	1	-0.79%	116,053.15
overall	**3**	**-1.16%**	**136,399.17**	**0**	**0**	**-**	**-**	**3**	**-1.16%**	**136,399.17**

Table J-24: Cost Data for Design Build (Major) between $10 and $20 Million

Design Build (Major)										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	1	-6.11%	682,674.42	0	0	-	-	1	-6.11%	682,674.42
2	1	-0.99%	134,393.92	0	1	3.86%	-496,448.49	2	1.37%	-181,027.29
4	0	-	-	0	4	0.78%	-109,300.75	4	0.78%	-109,300.75
5	0	-	-	0	3	3.73%	-596,342.39	3	3.73%	-596,342.39
8	1	-0.86%	133,962.76	0	1	5.39%	-746,135.84	2	2.08%	-306,086.54
overall	**3**	**-2.36%**	**317,010.37**	**0**	**9**	**2.65%**	**-385,423.83**	**12**	**1.47%**	**-209,815.28**

Table J-25: Cost Data for Lump Sum between $10 and $20 Million

Lump Sum										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	1	-0.11%	11,880.90	0	1	14.02%	-1,522,762.20	2	7.04%	-755,440.70
2	2	-2.23%	274,862.56	0	1	1.62%	-164,677.36	3	-1.11%	128,349.25
4	2	-5.94%	1,031,533	0	1	1.07%	-152,553.01	3	-3.90%	636,837.64
overall	**5**	**-3.75%**	**524,934.39**	**0**	**3**	**5.21%**	**-613,330.86**	**8**	**-0.75%**	**98,084.92**

Table J-26: Cost Data for Incentive/Disincentive between $10 and $20 Million

Incentive/Disincentive										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	0	-	-	0	1	1.22%	-135,694.88	1	1.22%	-135,694.88
4	1	-6.07%	1,080,328.82	0	0	-	-	1	-6.07%	1,080,328.82
5	0	-	-	0	1	13.35%	-1,751,294.40	1	13.35%	-1,751,294.40
6	0	-	-	0	2	10.98%	-1,533,315.61	2	10.98%	-1,533,315.61
overall	**1**	**-6.07%**	**1,080,328.82**	**0**	**4**	**9.49%**	**-1,238,405.12**	**5**	**5.53%**	**-774,658.33**

Table J-27: Cost Data for A+B between $10 and $20 Million

A+B										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	0	-	-	0	2	2.08%	-383,948.77	2	2.08%	-383,948.77
2	0	-	-	0	1	14.83%	-1,882,878.15	1	14.83%	-1,882,878.15
3	0	-	-	0	3	3.54%	-534,981.75	3	3.54%	-534,981.75
overall	**0**	**-**	**-**	**0**	**6**	**4.49%**	**-709,286.82**	**6**	**4.49%**	**-709,286.82**

Table J-28: Cost Data for No Excuse Bonus between $10 and $20 Million

No Excuse Bonus										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
4	1	-3.69%	715,691.05	0	1	4.57%	-536,560.64	2	-0.58%	89,565.20
overall	**1**	**-3.69%**	**715,691.05**	**0**	**1**	**4.57%**	**-536,560.64**	**2**	**-0.58%**	**89,565.20**

Table J-29: Time Data for Design Bid Build between $5 and $10 Million

Design Bid Build										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	4	-11.41%	63.5	4	0	-	-	8	-5.98%	31.75
2	20	-3.53%	11.4	16	0	-	-	36	-1.70%	6.33
3	11	-3.13%	15.45	7	3	6.86%	-29.33	21	-0.80%	3.9
4	7	-5.59%	29.57	3	1	5.61%	-12	11	-3.60%	17.73
5	7	-2.00%	8.29	5	1	0.45%	-2	13	-1.07%	4.31
6	5	-0.45%	2.8	5	0	-	-	10	-0.25%	1.4
7	14	-4.10%	20.36	11	1	4.04%	-27	26	-2.14%	9.92
8	4	-1.89%	7.5	6	0	-	-	10	-0.77%	3
overall	**72**	**-3.85%**	**17.31**	**57**	**6**	**4.93%**	**-21.5**	**135**	**-1.86%**	**8.27**

Table J-30: Time Data for Design Build (Minor) between $5 and $10 Million

Design Build (Minor)										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	1	-0.29%	2	0	1	7.55%	-58	2	3.86%	-28
3	1	-0.79%	7	0	0	-	-	1	-0.79%	7
4	1	-0.56%	3	2	0	-	-	3	-0.16%	1
5	1	-0.39%	1	0	1	4.20%	-20	2	2.60%	-9.5
6	0	-	-	0	1	6.12%	-43	1	6.12%	-43
7	0	-	-	2	0	-	-	2	0.00%	0
overall	**4**	**-0.55%**	**3.25**	**4**	**3**	**6.21%**	**-40.33**	**11**	**1.59%**	**-9.82**

Table J-31: Time Data for Design Build (Major) between $5 and $10 Million

Design Build (Major)										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	1	-0.83%	5	3	1	10.05%	-82	5	2.09%	-15.4
2	0	-	-	1	0	-	-	1	0.00%	0
4	0	-	-	1	0	-	-	1	0.00%	0
5	1	-0.30%	2	1	0	-	-	2	-0.16%	1
6	1	-10.54%	55	0	0	-	-	1	-10.54%	55
overall	**3**	**-3.45%**	**20.67**	**6**	**1**	**10.05%**	**-82**	**10**	**0.31%**	**-2**

Table J-32: Time Data for Lump Sum between $5 and $10 Million

Lump Sum										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	2	-6.80%	20.5	3	1	1.09%	-3	6	-2.11%	6.33
2	7	-3.42%	6.57	6	0	-	-	13	-1.79%	3.54
3	4	-3.33%	7.5	1	0	-	-	5	-2.44%	6
4	1	-0.29%	1	2	0	-	-	3	-0.09%	0.33
7	2	-14.46%	29	1	0	-	-	3	-7.88%	19.33
8	0	-	-	0	1	0.66%	-5	1	0.66%	-5
overall	**16**	**-4.90%**	**11**	**13**	**2**	**0.78%**	**-4**	**31**	**-2.06%**	**5.42**

Table J-33: Time Data for Incentive/Disincentive between $5 and $10 Million

Incentive/Disincentive										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	1	-19.74%	123	0	0	-	-	1	-19.74%	123
4	4	-18.80%	93.75	2	0	-	-	6	-14.64%	62.5
6	5	-12.00%	53	0	1	6.12%	-43	6	-7.62%	37
overall	**10**	**-15.81%**	**76.3**	**2**	**1**	**6.12%**	**-43**	**13**	**-11.81%**	**55.38**

Table J-34: Time Data for A+B between $5 and $10 Million

A+B										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
3	2	-14.85%	35.5	0	0	-	-	2	-14.85%	35.5
5	0	-	-	0	1	0.48%	-1	1	0.48%	-1
overall	**2**	**-14.85%**	**35.5**	**0**	**1**	**-**	**-**	**3**	**-10.20%**	**23.33**

Table J-35: Time Data for No Excuse Bonus between $5 and $10 Million

No Excuse Bonus										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	2	-3.17%	8	0	0	-	-	2	-3.17%	8
3	0	-	-	1	0	-	-	1	0.00%	0
4	1	-7.02%	33	0	0	-	-	1	-7.02%	33
overall	**3**	**-5.03%**	**16.33**	**1**	**0**	**-**	**-**	**4**	**-3.48%**	**12.25**

$5 to $10 Million
Cost Data

Table J-36: Cost Data for Design Bid Build between $5 and $10 Million

Design Bid Build											
COST											
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	6	-14.67%	1,135,547.41	0	2	0.52%	-38,788.11	8	-10.96%	841,963.53
2	15	-5.28%	336,502.62	0	21	3.80%	-236,070.42	36	-0.04%	2,501.68
3	7	-6.77%	422,819.23	0	14	5.22%	-402,902.49	21	1.77%	-127,661.91
4	5	-4.24%	293,911.54	0	6	3.64%	-247,921.15	11	0.02%	-1,633.56
5	5	-7.23%	452,443.62	0	8	6.54%	-473,025.79	13	1.71%	-117,076.02
6	8	-4.83%	318,982.75	0	2	2.01%	-161,767.02	10	-3.23%	222,832.80
7	10	-4.25%	312,986.88	0	16	4.79%	-344,330.40	26	1.26%	-91,516.06
8	6	-8.59%	621,615.71	0	4	2.24%	-151,430.74	10	-4.43%	312,397.13
overall	**62**	**-6.63%**	**525,265.26**	**0**	**73**	**4.39%**	**-306,657.08**	**135**	**-0.60%**	**41,316.98**

Table J-37: Cost Data for Design Build (Minor) between $5 and $10 Million

Design Build (Minor)										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	2	-0.84%	49,099.66	0	0	-	-	2	-0.84%	49,099.66
3	1	-0.30%	17,796.82	0	0	-	-	1	-0.30%	17,796.82
4	3	-1.35%	93,270.60	0	0	-	-	3	-1.35%	93,270.60
5	2	-5.84%	403,606.56	0	0	-	-	2	-5.84%	403,606.56
6	1	-2.16%	163,132.68	0	0	-	-	1	-2.16%	163,132.68
7	1	-0.85%	48,466.31	0	1	0.55%	-27,699.57	2	-0.19%	10,383.37
overall	**10**	**-2.16%**	**141,462.01**	**0**	**1**	**0.55%**	**-27,699.57**	**11**	**-1.97%**	**126,083.68**

Table J-38: Cost Data for Design Build (Major) between $5 and $10 Million

Design Build (Major)										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	3	-2.10%	145,563.30	0	2	1.73%	-139,640.86	5	-0.43%	31,481.64
2	0	-	-	0	1	0.16%	-11,769.92	1	0.16%	-11,769.92
4	1	-1.40%	104,956.23	0	0	-	-	1	-1.40%	104,956.23
5	2	-1.31%	113,624.88	0	0	-	-	2	-1.31%	113,624.88
6	0	-	-	0	1	0.60%	-49,111.52	1	0.60%	-49,111.52
overall	**6**	**-1.69%**	**128,149.31**	**0**	**4**	**1.07%**	**-85,040.79**	**10**	**-0.56%**	**42,873.27**

Table J-39: Cost Data for Lump Sum between $5 and $10 Million

Lump Sum										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	3	-2.16%	140,950.71	0	3	1.66%	-92,732.39	6	-0.40%	24,109.16
2	8	-2.14%	137,979.37	0	5	5.03%	-281,587.46	13	1.41%	-93,823.61
3	5	-2.38%	147,905.52	0	0	-	-	5	-2.38%	147,905.52
4	2	-4.66%	373,082.77	0	1	0.75%	-65,623.05	3	-2.75%	226,847.49
7	1	-0.12%	5,834.97	0	2	5.74%	-326,657.10	3	3.95%	-215,826.41
8	1	-1.04%	93,406	0	0	-	-	1	-1.04%	93,406
overall	**20**	**-2.35%**	**155,581.06**	**0**	**11**	**3.71%**	**-218,642.89**	**31**	**0.10%**	**-6,743.71**

Table J-40: Cost Data for Incentive/Disincentive between $5 and $10 Million

Incentive/Disincentive										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	0	-	-	0	1	1.92%	-145,835.88	1	1.92%	-145,835.88
4	1	-6.79%	380,352.96	0	5	6.13%	-456,495.66	6	4.44%	-317,020.89
6	3	-1.25%	85,480.77	0	3	4.57%	-283,860.48	6	1.52%	-99,189.85
overall	**4**	**-2.44%**	**159,198.82**	**0**	**9**	**5.17%**	**-364,432.85**	**13**	**2.95%**	**-203,315.41**

Table J-41: Cost Data for A+B between $5 and $10 Million

A+B										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
3	0	-	-	0	2	17.47%	-1,430,541.65	2	17.47%	-1,430,541.65
5	0	-	-	0	1	9.03%	-644,251.65	1	9.03%	-644,251.65
overall	**0**	**-**	**-**	**0**	**3**	**14.91%**	**-1,168,444.98**	**3**	**14.91%**	**-1,168,444.98**

Table J-42: Cost Data for No Excuse Bonus between $5 and $10 Million

No Excuse Bonus										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	0	-	-	0	2	3.77%	-275,094.42	2	3.77%	-275,094.42
3	0	-	-	0	1	3.36%	-284,159.79	1	3.36%	-284,159.79
4	0	-	-	0	1	4.91%	-428,764.68	1	4.91%	-428,764.68
overall	**0**	**-**	**-**	**0**	**4**	**3.98%**	**-315,778.33**	**4**	**3.98%**	**-315,778.33**

$1 to $5 Million
Time Data

Table J-43: Time Data for Design Bid Build between $1 and $5 Million

Design Bid Build										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	15	-10.03%	26.73	11	2	4.99%	-9	28	-4.52%	13.68
2	78	-6.30%	16.27	48	8	24.78%	-66.88	134	-2.21%	5.48
3	50	-5.67%	14.62	32	7	3.13%	-9	89	-2.80%	7.51
4	67	-3.32%	9.91	47	2	8.50%	-27.5	116	-1.80%	5.25
5	44	-4.94%	10.59	29	4	15.52%	-40.75	77	-1.76%	3.94
6	31	-2.83%	8.45	50	3	6.09%	-20.33	84	-0.76%	2.39
7	44	-12.27%	36.05	54	7	25.32%	-85.14	105	-3.36%	9.43
8	10	-2.44%	6.8	15	0	-	-	25	-1.01%	2.72
overall	**339**	**-5.96%**	**16.07**	**286**	**33**	**15.56%**	**-45.18**	**658**	**-2.21%**	**6.01**

Table J-44: Time Data for Design Build (Minor) between $1 and $5 Million

Design Build (Minor)										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	4	-6.62%	20	5	1	2.03%	-5	10	-2.31%	7.5
2	5	-4.99%	17.6	5	1	3.63%	-14	11	-1.73%	6.73
3	4	-2.43%	10.25	3	0	-	-	7	-1.26%	5.86
4	2	-5.49%	19	5	3	10.53%	-43.33	10	2.19%	-9.2
5	4	-2.85%	9.75	1	1	12.50%	-40	6	0.05%	-0.17
6	0	-	-	1	0	-	-	1	0.00%	0
overall	**19**	**-4.26%**	**15.05**	**20**	**6**	**6.70%**	**-19.67**	**45**	**-0.56%**	**2.16**

Table J-45: Time Data for Design Build (Major) between $1 and $5 Million

Design Build (Major)										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	6	-3.09%	11.5	6	3	8.94%	-35	15	0.64%	-2.4
2	0	-	-	1	0	-	-	1	0.00%	0
4	2	-5.06%	24.5	0	1	36.65%	-188	3	9.38%	-46.33
5	0	-	-	3	1	50.53%	-143	4	9.76%	-35.75
6	0	-	-	1	0	-	-	1	0.00%	0
7	1	-10.29%	25	0	0	-	-	1	-10.29%	25
8	1	-0.80%	3	0	1	1.98%	-8	2	0.64%	-2.5
overall	**10**	**-3.82%**	**14.6**	**11**	**6**	**18.70%**	**-74**	**27**	**2.78%**	**-11.04**

Table J-46: Time Data for Lump Sum between $1 and $5 Million

Lump Sum										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	35	-7.73%	12.29	41	10	19.27%	-37.3	86	-0.38%	0.66
2	15	-10.25%	18.6	16	2	6.84%	-13.5	33	-4.13%	7.64
3	6	-18.95%	33.17	2	1	14.06%	-27	9	-11.88%	19.11
4	6	-6.14%	16.33	5	0	-	-	11	-3.49%	8.91
5	29	-5.16%	10	18	3	29.19%	-47	50	-1.62%	2.98
6	1	-0.58%	3	0	0	-	-	1	-0.58%	3
7	7	-5.36%	12.14	3	0	-	-	10	-3.85%	8.5
8	3	-8.13%	12	2	0	-	-	5	-3.96%	7.2
overall	**102**	**-7.43%**	**13.92**	**87**	**16**	**18.90%**	**-35.5**	**205**	**-2.24%**	**4.16**

Table J-47: Time Data for Incentive/Disincentive between $1 and $5 Million

Incentive/Disincentive										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	2	-7.69%	8	1	1	10.99%	-59	4	4.58%	-10.75
3	1	-3.74%	4	0	0	-	-	1	-3.74%	4
4	7	-12.80%	31.71	1	1	12.15%	-44	9	-7.53%	19.78
6	18	-14.09%	35.89	3	1	0.50%	-2	22	-10.71%	29.27
overall	**28**	**-13.39%**	**31.71**	**5**	**3**	**8.06%**	**-35**	**36**	**-8.31%**	**21.75**

Table J-48: Time Data for A+B between $1 and $5 Million

A+B										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	1	-0.65%	1	2	0	-	-	3	-0.29%	0.33
3	1	-0.45%	1	0	0	-	-	1	-0.45%	1
5	0	-	-	1	0	-	-	1	0.00%	0
7	0	-	-	1	0	-	-	1	0.00%	0
overall	**2**	**-0.53%**	**1**	**4**	**0**	**-**	**-**	**6**	**-0.21%**	**0.33**

Table J-49: Time Data for No Excuse Bonus between $1 and $5 Million

No Excuse Bonus										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	2	-13.05%	29.5	0	0	-	-	2	-13.05%	29.5
4	3	-25.77%	72.33	0	0	-	-	3	-25.77%	72.33
overall	**5**	**-21.33%**	**55.2**	**0**	**0**	**-**	**-**	**5**	**-21.33%**	**55.2**

$1 to $5 Million
Cost Data

Table J-50: Cost Data for Design Bid Build between $1 and $5 Million

Design Bid Build										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	22	-11.71%	255,240.94	0	6	1.47%	-53,251.68	28	-7.60%	189,135.38
2	70	-5.75%	127,513.93	0	64	4.90%	-133,525.05	134	-0.12%	2,838.60
3	49	-3.81%	74,739.82	0	40	6.54%	-192,956.52	89	1.89%	-45,573.14
4	100	-4.92%	129,123.6	0	16	1.59%	-48,231.84	116	-3.91%	104,660.78
5	38	-8.37%	177,776.5	0	39	4.78%	-130,778.74	77	-0.88%	21,495.27
6	74	-5.45%	116,587.37	0	10	3.70%	-100,731.54	84	-4.10%	90,716.07
7	79	-5.84%	127,955.28	0	26	4.87%	-138,959.57	105	-2.63%	61,862.07
8	15	-4.47%	115,886.28	1	9	4.63%	-137,592.71	25	-0.75%	19,997.44
overall	**447**	**-5.76%**	**130,527.12**	**1**	**210**	**4.74%**	**-134,828.82**	**658**	**-1.86%**	**45,640.64**

Table J-51: Cost Data for Design Build (Minor) between $1 and $5 Million

Design Build (Minor)										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	4	-3.94%	43,180.28	0	6	5.01%	-109,427.58	10	2.77%	-48,384.44
2	8	-1.69%	27,879.58	0	3	0.94%	-21,307.19	11	-0.80%	14,465.01
3	4	-2.03%	51,148.78	1	2	3.37%	-89,781.48	7	-0.15%	3,576.02
4	10	-2.79%	59,939.54	0	0	-	-	10	-2.79%	59,939.54
5	5	-2.28%	66,960.30	0	1	8.25%	-203,765.13	6	-0.76%	21,839.40
6	1	-0.76%	11,639.19	0	0	-	-	1	-0.76%	11,639.19
overall	**32**	**-2.37%**	**48,318.41**	**1**	**12**	**3.98%**	**-91,984.60**	**45**	**-0.47%**	**9,830.53**

Table J-52: Cost Data for Design Build (Major) between $1 and $5 Million

Design Build (Major)										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	10	-3.17%	66,031.26	0	5	5.60%	-122,171.97	15	-0.16%	3,296.85
2	1	-1.05%	16,897.35	0	0	-	-	1	-1.05%	16,897.35
4	3	-7.11%	167,305.64	0	0	-	-	3	-7.11%	167,305.64
5	2	-3.54%	67,690	0	2	0.60%	-19,981.84	4	-0.91%	23,854.08
6	1	-0.83%	37,241.42	0	0	-	-	1	-0.83%	37,241.42
7	1	-2.23%	50,018.60	0	0	-	-	1	-2.23%	50,018.60
8	2	-1.04%	30,902.85	0	0	-	-	2	-1.04%	30,902.85
overall	**20**	**-3.19%**	**73,178.63**	**0**	**7**	**3.70%**	**-92,974.79**	**27**	**-1.28%**	**30,101.82**

Table J-53: Cost Data for Lump Sum between $1 and $5 Million

Lump Sum										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	54	-3.63%	65,769.60	1	31	3.04%	-77,203.40	86	-0.65%	13,468.06
2	20	-2.88%	62,891.40	0	13	3.49%	-85,382.93	33	-0.20%	4,480.30
3	4	-1.81%	29,259	0	5	7.96%	-233,122.77	9	4.97%	-116,508.65
4	8	-3.90%	83,269.02	0	3	7.38%	-196,805.56	11	-0.30%	6,885.04
5	25	-3.20%	57,221.63	2	23	3.39%	-78,029.34	50	0.36%	-7,282.68
6	1	-1.18%	15,403.46	0	0	-	-	1	-1.18%	15,403.46
7	8	-6.41%	140,777.45	0	2	4.65%	-189,946.83	10	-2.90%	74,632.59
8	3	-2.63%	41,077.08	0	2	1.69%	-30,305.53	5	-0.76%	12,524.04
overall	**123**	**-3.56%**	**67,381.87**	**3**	**79**	**3.79%**	**-94,867.01**	**205**	**-0.18%**	**3,870.61**

Table J-54: Cost Data for Incentive/Disincentive between $1 and $5 Million

Incentive/Disincentive										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	2	-7.93%	335,061.27	0	2	13.78%	-226,788.46	4	-1.84%	54,136.41
3	0	-	-	0	1	31.97%	-521,719.48	1	31.97%	-521,719.48
4	8	-6.24%	194,567.06	0	1	0.18%	-6,551.49	9	-5.41%	172,220.55
6	12	-5.12%	132,818.38	0	10	4.00%	-104,348.53	22	-0.96%	25,015.24
overall	**22**	**-5.92%**	**173,658.16**	**0**	**14**	**5.84%**	**-144,666.66**	**36**	**-1.81%**	**49,865.18**

Table J-55: Cost Data for A+B between $1 and $5 Million

A+B										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	2	-4.67%	78,027.04	0	1	13.53%	-363,454.63	3	3.44%	-69,133.51
3	0	-	-	0	1	6.65%	-205,941.11	1	6.65%	-205,941.11
5	1	-6.77%	90,033.02	0	0	-	-	1	-6.77%	90,033.02
7	1	-0.56%	17,909.15	0	0	-	-	1	-0.56%	17,909.15
overall	**4**	**-3.35%**	**65,999.06**	**0**	**2**	**9.84%**	**-284,697.87**	**6**	**2.24%**	**-50,899.91**

Table J-56: Cost Data for No Excuse Bonus between $1 and $5 Million

No Excuse Bonus										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	1	-0.04%	1,837.69	0	1	1.59%	-50,934.82	2	0.65%	-24,548.56
4	2	-6.64%	240,372.42	0	1	4.92%	-136,461.83	3	-3.44%	11,4761
overall	**3**	**-4.18%**	**160,860.84**	**0**	**2**	**3.13%**	**-93,698.33**	**5**	**-1.69%**	**59,037.17**

Under $1 Million
Time Data

Table J-57: Time Data for Design Bid Build under $1 Million

Design Bid Build										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	34	-5.71%	4.79	22	2	10.95%	-11	58	-2.66%	2.43
2	41	-4.97%	6.46	40	4	4.65%	-7.75	85	-2.02%	2.75
3	76	-6.53%	7.75	45	5	10.33%	-10	126	-3.61%	4.28
4	50	-5.42%	9.16	40	4	16.04%	-25.75	94	-2.02%	3.78
5	28	-4.89%	5.32	34	3	12.12%	-16	65	-1.39%	1.55
6	36	-3.67%	5.75	61	5	3.08%	-9.4	102	-0.88%	1.57
7	35	-6.49%	7.77	31	1	2.33%	-5	67	-2.86%	3.99
8	4	-2.33%	4	8	0	-	-	12	-0.88%	1.33
overall	**304**	**-5.40%**	**6.97**	**281**	**24**	**7.41%**	**-12.75**	**609**	**-2.11%**	**2.98**

Table J-58: Time Data for Design Build (Minor) under $1 Million

Design Build (Minor)										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	7	-25.12%	45.43	5	1	4.00%	-13	13	-10.75%	23.46
2	18	-10.72%	19.22	17	5	5.00%	-10.8	40	-3.89%	7.3
3	18	-8.79%	13.56	7	1	4.79%	-9	26	-5.80%	9.04
4	1	-2.84%	5	0	0	-	-	1	-2.84%	5
5	0	-	-	2	0	-	-	2	0.00%	0
6	0	-	-	1	0	-	-	1	0.00%	0
7	0	-	-	2	0	-	-	2	0.00%	0
overall	**44**	**-12.26%**	**20.75**	**34**	**7**	**4.77%**	**-10.86**	**85**	**-5.18%**	**9.85**

Table J-59: Time Data for Design Build (Major) under $1 Million

Design Build (Major)										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	9	-12.19%	31.56	3	1	8.92%	-33	13	-7.85%	19.31
2	0	-	-	1	0	-	-	1	0.00%	0
8	0	-	-	1	0	-	-	1	0.00%	0
overall	**9**	**-12.19%**	**31.56**	**5**	**1**	**-**	**-**	**15**	**-6.52%**	**16.73**

Table J-60: Time Data for Lump Sum under $1 Million

Lump Sum										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	87	-4.97%	4.18	56	16	3.61%	-3.94	159	-2.19%	1.89
2	24	-6.56%	6.29	17	1	3.67%	-4	42	-3.91%	3.5
3	13	-2.39%	2.62	6	0	-	-	19	-1.75%	1.79
4	4	-3.73%	6	6	0	-	-	10	-1.60%	2.4
5	54	-5.65%	5.5	37	5	10.22%	-8.2	96	-2.81%	2.67
6	2	-9.00%	9	1	0	-	-	3	-6.41%	6
7	7	-9.00%	9	11	0	-	-	18	-4.17%	3.5
8	7	-3.08%	4	3	0	-	-	10	-2.25%	2.8
overall	**198**	**-5.22%**	**4.94**	**137**	**22**	**4.79%**	**-4.91**	**357**	**-2.63%**	**2.44**

Table J-61: Time Data for Incentive/Disincentive under $1 Million

Incentive/Disincentive										
TIME										
District	Projects Finished Early	% Change of Days Used Over Current	Average Days Saved per Project	Projects Finished On Time	Projects Finished Late	% Change of Days Used Over Current	Average Days Saved per Project	Total	% Change of Days Used Over Current	Average Days Saved per Project
1	1	-10.00%	10	1	0	-	-	2	-5.13%	5
4	1	-22.22%	8	0	0	-	-	1	-22.22%	8
6	12	-18.58%	27.08	1	0	-	-	13	-16.02%	25
overall	**14**	**-18.20%**	**24.5**	**2**	**0**	**-**	**-**	**16**	**-15.18%**	**21.44**

Under $1 Million
Cost Data

Table J-62: Cost Data for Design Bid Build under $1 Million

Design Bid Build										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	51	-7.17%	27,753.44	3	4	9.87%	-40,620.50	58	-5.81%	21,602.47
2	63	-5.83%	26,018.75	3	19	3.31%	-19,733.50	85	-3.17%	14,873.47
3	105	-5.48%	21,035.58	1	20	4.06%	-21,556.70	126	-3.49%	14,107.96
4	92	-6.02%	30,741.66	0	2	1.50%	-7,278.80	94	-5.87%	29,932.71
5	54	-4.43%	17,990.33	0	11	2.18%	-1,0256	65	-3.17%	13,210.18
6	96	-7.27%	38,219.12	0	6	2.36%	-14,732.90	102	-6.61%	35,104.30
7	60	-6.80%	35,916.95	1	6	4.52%	-18,130.70	67	-5.99%	30,540.79
8	9	-4.75%	34,359.75	1	2	1.62%	-4,147.25	12	-4.13%	25,078.60
overall	**530**	**-6.18%**	**28,672.35**	**9**	**70**	**3.58%**	**-18,591.5**	**609**	**-4.91%**	**2,2816**

Table J-63: Cost Data for Design Build (Minor) under $1 Million

Design Build (Minor)										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	7	-7.83%	40,343.59	5	1	1.70%	-11,769.80	13	-4.54%	20,818.10
2	21	-4.27%	15,560.85	8	11	0.77%	-4,814.99	40	-1.63%	6,845.35
3	6	-4.01%	12,537.18	15	5	0.19%	-699.46	26	-1.32%	2,758.68
4	1	-5.06%	20,210.89	0	0	-	-	1	-5.06%	20,210.89
5	2	-4.75%	39,641.17	0	0	-	-	2	-4.75%	39,641.17
6	1	-7.37%	25,000	0	0	-	-	1	-7.37%	25,000
7	2	-6.09%	41,831.03	0	0	-	-	2	-6.09%	41,831.03
overall	**40**	**-5.28%**	**22,314.03**	**28**	**17**	**0.73%**	**-4,013.65**	**85**	**-2.57%**	**9,698**

Table J-64: Cost Data for Design Build (Major) under $1 Million

Design Build (Major)										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	7	-6.24%	32,403.06	4	2	0.13%	-764.81	13	-3.93%	17,330.14
2	1	-2.68%	17,662.36	0	0	-	-	1	-2.68%	17,662.36
8	1	-4.91%	45,000	0	0	-	-	1	-4.91%	45,000
overall	**9**	**-5.56%**	**32,164.87**	**4**	**2**	**0.13%**	**-764.81**	**15**	**-3.94%**	**19,196.95**

Table J-65: Cost Data for Lump Sum under $1 Million

Lump Sum										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	144	-4.67%	15,823.38	14	1	4.64%	-44,746.10	159	-4.29%	14,049.19
2	30	-4.69%	13,986.28	5	7	3.07%	-19,923.10	42	-1.94%	6,669.69
3	19	-5.03%	18,665.80	0	0	-	-	19	-5.03%	18,665.80
4	10	-5.01%	20,748.88	0	0	-	-	10	-5.01%	20,748.88
5	95	-4.71%	17,030.39	1	0	-	-	96	-4.70%	16,852.99
6	3	-5.62%	25,623.22	0	0	-	-	3	-5.62%	25,623.22
7	13	-5.72%	24,486.44	5	0	-	-	18	-5.38%	17,684.65
8	9	-4.96%	20,220.05	1	0	-	-	10	-4.88%	18,198.04
overall	**323**	**-4.79%**	**16,889.64**	**26**	**8**	**3.34%**	**-23,025.90**	**357**	**-4.28%**	**14,765.12**

Table J-66: Cost Data for Incentive/Disincentive under $1 Million

Incentive/Disincentive										
COST										
District	Projects Finished with Cost Underrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Projects Finished at Current Contract Cost	Projects Finished with Cost Overrun	% Change of Actual Over Current Cost	Average Cost Saved per Project	Total	% Change of Actual Over Current Cost	Average Cost Saved per Project
1	1	-6.05%	57,647.86	0	1	0.12%	-1,011.08	2	-3.17%	28,318.39
4	0	-	-	0	1	2.52%	-14,000	1	2.52%	-14,000
6	11	-6.72%	44,442.75	0	2	6.51%	-33,607.30	13	-5.07%	32,435.05
overall	**12**	**-6.64%**	**45,543.17**	**0**	**4**	**3.40%**	**-20,556.40**	**16**	**-4.36%**	**29,018.28**

Appendix K: Comprehensive Project Outliers Data

Appendix K includes the comprehensive list of outliers, including the three projects that were terminated earlier than their contract finish dates (“dataset outliers”) and were excluded from analysis, as well as the list of potential outliers identified through the 2 & 3 Sigma approaches (“statistical outliers”). Projects are broken out by contracting methods as well as cost categories. Among the identified potential outliers, the projects highlighted in red cause a change from savings to time delay or cost overrun. The projects highlighted in yellow considerably alter the results but not enough to change the direction.

Table K-1: Outlier Projects Terminated from Analysis

Terminated Projects (excluded from analysis)								
Design Bid Build $10 to $20 Million								
District	**Outlier Based On**	**Contract ID**	**Current Contract Days**	**% Change of Days Used Over Current**	**Days Used**	**Current Contract Amount**	**% Change of Actual Over Current Cost**	**Estimate Paid to Date**
02	both	JPAC1226	330	-100.00%	0	$11,856,393.31	-100.00%	$.00
Design Bid Build $5 to $10 Million								
08	Both	E8M75	295	-100.00%	0	$5,231,172.50	-98.03%	$103,220.50
Lump Sum $1 to $5 Million								
08	Both	E8M17	173	-68.79%	54	$2,946,112.58	-98.74%	$37,080.77

Table K-2: Outlier Projects with Changes in Direction

District	Outlier Based On	Contract ID	Current Contract Days	% Change of Days Used Over Current	Days Used	Current Contract Amount	% Change of Actual Over Current Cost	Estimate Paid to Date
Projects Change the Direction of Results								
Design Bid Build $10 to $20 Million								
included in "with outliers"								
included in "outliers removed (within 3 std. dev.)" and "with outliers"								
02	Time	T2359	957	39.18%	1,332	$12,930,758.30	-1.17%	$12,779,717.05
Lump Sum $5 to $10 Million								
included in "with outliers"								
02	Cost	T2178	347	0.00%	347	$6,771,045.96	13.52%	$7,686,650.46
07	Time	E7E09	205	-27.32%	149	$6,310,540.00	4.79%	$6,612,786.46
Design Build Major $1 to $5 Million								
included in "with outliers"								
05	Time	E5K77	283	50.53%	426	$2,434,458.12	-3.51%	$2,349,078.12
included in "outliers removed (within 3 std. dev.)" and "with outliers"								
01	Cost	E1J07	210	0.00%	210	$1,025,501.17	10.25%	$1,130,659.94
01	Cost	E1J06	293	0.00%	293	$2,088,057.74	12.33%	$2,345,579.77
01	Cost	E1J04	215	-5.12%	204	$2,440,500.00	10.07%	$2,686,313.84
01	Cost	E1K49	574	12.02%	643	$1,196,714.07	-13.81%	$1,031,420.78
04	Time	E4K85	513	36.65%	701	$4,380,939.90	-9.78%	$3,952,534.03

Table K-3: Outlier Projects with Changes in Extent of Contrast

Projects Change the Extent of Contrast								
Design Build (Major) Above $20 Million								
included in "with outliers"								
District	Outlier Based On	Contract ID	Current Contract Days	% Change of Days Used Over Current	Days Used	Current Contract Amount	% Change of Actual Over Current Cost	Estimate Paid to Date
08	Cost	E8H59	720	0.00%	720	$40,532,428.75	9.97%	$44,572,368.04
included in "outliers removed (within 3 std. dev.)" and "with outliers"								
01	Time	E1F59	1,227	-13.53%	1,061	$438,160,239.72	4.55%	$458,089,392.04
05	Time	E5L95	769	-14.95%	654	$25,809,495.89	2.67%	$26,499,275.68

Table K-4: Outlier Projects for Design Build

Design Build (Minor) $1 to $5 Million								
included in "with outliers"								
District	Outlier Based On	Contract ID	Current Contract Days	% Change of Days Used Over Current	Days Used	Current Contract Amount	% Change of Actual Over Current Cost	Estimate Paid to Date
01	Both	E1H02	216	-24.54%	163	$2,317,500.00	7.60%	$2,493,613.84
04	Both	E4K68	425	16.71%	496	$1,010,942.22	-12.08%	$888,831.05
included in "outliers removed (within 3 std. dev.)" and "with outliers"								
01	Cost	E1I13	395	0.00%	395	$2,292,774.65	6.50%	$2,441,804.98
02	Time	E2O66	415	-17.11%	344	$3,057,000.00	-0.39%	$3,045,145.71
05	Time	E5L73	139	-20.86%	110	$2,043,000.00	-3.24%	$1,976,814.77
05	Cost	E5N54	590	-0.17%	589	$2,468,958.09	8.25%	$2,672,723.22

Table K-5: Outlier Projects for Design Bid Build

District	outlier based on	Contract ID	Current Contract Days	% change of days used over current	Days Used	Current Contract Amount	% change of actual over current cost	Estimate Paid to Date
Design Bid Build above $20 Million								
included in "with outliers"								
08	time	E8I61	1,079	-27.80%	779	$49,106,906.36	3.87%	$51,008,244.79
included in "outliers removed (within 3 std. dev.)" and "with outliers"								
01	time	T1329	1,054	19.17%	1,256	$30,577,698.60	0.85%	$30,838,661.04
07	time	T7191	900	-26.33%	663	$31,722,238.59	-2.25%	$31,007,399.14
08	cost	E8H90	1,226	0.00%	1,226	$94,671,555.40	11.18%	$105,252,504.82
Design Bid Build $5 to $10 Million								
included in "with outliers"								
01	Both	E1J84	367	-66.76%	122	$5,445,496.50	-96.48%	$191,477.39
included in "outliers removed (within 3 std. dev.)" and "with outliers"								
02	Time	T2423	175	-26.86%	128	$5,237,137.28	-1.39%	$5,164,262.88
07	Cost	T7139	411	0.00%	411	$7,373,461.36	25.89%	$9,282,570.33
Design Bid Build $1 to $5 Million								
included in "with outliers"								
01	Cost	E1I92	732	-0.14%	731	$1,194,919.00	-28.47%	$854,761.70
01	Both	E1J83	425	-74.82%	107	$4,392,817.71	-82.75%	$757,740.73
02	Cost	T2271	203	-2.46%	198	$3,360,682.02	-25.99%	$2,487,226.43
02	Both	T2341	501	90.42%	954	$3,558,060.84	-25.49%	$2,651,154.65
02	Time	T2390	233	-48.07%	121	$3,442,908.15	-0.87%	$3,413,091.68
03	Time	E3J16	161	-38.51%	99	$3,139,620.18	11.88%	$3,512,528.50
03	Cost	T3171	220	-0.45%	219	$4,564,595.74	20.77%	$5,512,667.39
04	Cost	T4211	291	-19.24%	235	$2,121,446.90	-29.50%	$1,495,591.93

05	Cost	T5234	136	-0.74%	135	$2,085,085.85	21.68%	$2,537,225.04
05	Cost	T5269	166	-3.01%	161	$4,427,872.06	-27.48%	$3,211,082.43
05	Cost	T5359	237	-0.42%	236	$1,392,319.19	20.55%	$1,678,458.62
05	Time	T5377	230	-40.00%	138	$1,864,567.57	-1.47%	$1,837,094.03
06	Cost	T6173	178	-8.99%	162	$1,329,196.67	-25.47%	$990,615.40
07	Time	E7F25	104	-34.62%	68	$1,047,761.14	-23.71%	$799,329.56
07	Time	E7F28	351	-78.35%	76	$1,133,155.05	-4.30%	$1,084,447.12
07	Time	E7F83	362	-53.59%	168	$1,148,741.82	-4.06%	$1,102,061.98
07	Time	E7G65	316	46.84%	464	$2,914,614.85	-4.19%	$2,792,480.63
07	Cost	E7G71	590	-0.17%	589	$3,942,706.74	-29.00%	$2,799,395.82
07	Time	E7H37	550	-38.55%	338	$1,301,530.38	-3.87%	$1,251,185.39
07	Time	E7H79	300	-42.33%	173	$1,333,894.25	-3.91%	$1,281,779.25
07	Time	T7165	295	-37.97%	183	$1,590,369.53	-6.57%	$1,485,805.00
07	Cost	T7183	236	-21.61%	185	$2,956,466.99	23.32%	$3,645,893.47
07	Time	T7270	188	65.43%	311	$1,450,621.72	-16.03%	$1,218,120.99
07	Time	T7271	261	91.57%	500	$2,944,323.79	-10.05%	$2,648,286.49
07	Time	E7G68	216	30.09%	281	$1,276,746.75	-6.28%	$1,196,564.75
included in "outliers removed (within 3 std. dev.)" and "with outliers"								
02	Time	E2N02	186	-24.73%	140	$1,648,348.37	-3.45%	$1,591,463.61
02	Time	T2348	260	-31.54%	178	$2,771,667.17	-8.68%	$2,531,003.83
02	Both	T2351	267	-28.09%	192	$1,608,888.88	14.97%	$1,849,800.53
02	Time	T2354	397	-30.73%	275	$2,566,138.42	1.98%	$2,617,075.84
02	Cost	T2357	574	-3.83%	552	$4,520,989.82	17.06%	$5,292,055.91
02	Time	E2K88	161	-23.60%	123	$2,230,743.41	2.37%	$2,283,504.58
02	Time	E2L13	61	-22.95%	47	$1,211,612.65	1.66%	$1,231,709.18
03	Cost	T3335	253	0.79%	255	$3,321,698.03	-17.99%	$2,724,185.92
03	Cost	T3366	231	-9.96%	208	$1,837,484.37	12.86%	$2,073,811.63
03	Time	E3J23	393	-24.43%	297	$1,046,593.00	-5.32%	$990,964.01
04	Time	T4280	646	-22.91%	498	$1,724,067.94	-7.32%	$1,597,826.78
04	Cost	T4339	210	-0.48%	209	$1,177,147.93	-19.32%	$949,672.36

05	Time	T5204	207	27.54%	264	$3,722,029.14	-3.64%	$3,586,617.89
05	Cost	T5254	97	-15.46%	82	$2,029,006.41	-21.10%	$1,600,970.63
05	Cost	T5255	170	0.00%	170	$4,768,356.65	-22.96%	$3,673,694.15
05	Cost	T5261	193	-1.04%	191	$4,987,623.48	-19.69%	$4,005,607.06
05	Time	T5324	217	21.66%	264	$1,490,671.29	-5.57%	$1,407,592.54
05	Time	E5R72	96	-23.96%	73	$1,142,722.25	-8.68%	$1,043,588.95
06	Cost	E6F45	355	-0.28%	354	$1,182,814.49	-22.62%	$915,295.43
06	Cost	E6F47	322	0.00%	322	$2,638,416.90	-17.64%	$2,172,985.83
06	Time	E6H55	377	-23.08%	290	$2,547,091.34	-7.53%	$2,355,413.50
07	Time	E7F14	306	-24.18%	232	$1,085,789.76	8.78%	$1,181,128.63
07	Cost	E7F81	329	-17.93%	270	$2,108,117.25	-21.08%	$1,663,823.80
07	Time	E7I15	141	-29.08%	100	$1,001,702.51	-4.68%	$954,779.46
07	Cost	T7200	325	-17.54%	268	$4,574,318.28	-17.70%	$3,764,459.91
07	Cost	T7244	388	-0.52%	386	$3,983,045.12	13.05%	$4,502,731.78

Table K-6: Outlier Projects for Lump Sum

Lump Sum $1 to $5 Million								
included in "with outliers"								
District	Outlier Based On	Contract ID	Current Contract Days	% Change of Days Used Over Current	Days Used	Current Contract Amount	% Change of Actual Over Current Cost	Estimate Paid to Date
01	Cost	T1438	146	143.15%	355	$1,023,777.07	-26.25%	$755,035.45
05	Time	T5244	93	-40.86%	55	$1,004,995.52	-3.08%	$974,040.09
included in "outliers removed (within 3 std. dev.)" and "with outliers"								
01	Time	T1531	228	31.14%	299	$2,142,630.27	-5.46%	$2,025,600.86
01	Time	T1271	105	-37.14%	66	$1,046,571.56	-8.81%	$954,417.41
02	Time	E2J65	79	-35.44%	51	$1,561,128.95	-5.49%	$1,475,379.71
03	Time	T3245	192	14.06%	219	$4,918,543.01	15.67%	$5,689,519.31
03	Cost	T3298	307	-43.00%	175	$1,150,000.00	-0.57%	$1,143,475.00
05	Cost	T5231	129	10.85%	143	$2,137,039.10	16.17%	$2,482,615.14

05	Time	E5R53	136	54.41%	210	$1,073,026.00	-14.33%	$919,310.78

Table K-7: Outlier Projects for Incentive/Disincentive

Incentive/Disincentive $1 to $5 Million								
included in "with outliers"								
District	**Outlier Based On**	**Contract ID**	**Current Contract Days**	**% Change of Days Used Over Current**	**Days Used**	**Current Contract Amount**	**% Change of Actual Over Current Cost**	**Estimate Paid to Date**
03	Cost	T3499	107	-3.74%	103	$1,631,903.91	31.97%	$2,153,623.39
included in "outliers removed (within 3 std. dev.)" and "with outliers"								
01	Cost	T1252	105	-5.71%	99	$1,413,660.02	21.51%	$1,717,761.70
01	Time	T1305	537	10.99%	596	$3,891,346.79	-13.46%	$3,367,687.62
04	Time	T4251	362	12.15%	406	$2,491,325.01	-2.93%	$2,418,408.68
06	Cost	T6136	303	0.00%	303	$1,447,108.50	-21.50%	$1,135,943.00

Appendix L: Quality Performance CPPR Score Breakdown Explanation

Appendix L includes a brief breakdown of the CPPR score categories.

Contractor Past Performance Rating (CPPR) scores are a means to evaluate contractor performance according to nine specific performance criteria. These criteria are presented in Table L-1 with their category identification number, description, total points achievable (including bonus points for Categories 4, 7, and 9), and if deficiency letters are used to assess scores.

Table L-1: CPPR Category Breakdown and Point Distribution

	Description	Max Points	Bonus Points	Def. Letter Use
Category 1	Pursuit of Work	12		
Category 2	Proper MOT & Minimize Impacts to Traveling Public	12		yes
Category 3	Timely and Complete Submittal of Documents	8		yes
Category 4	Timely Completion of Project	14	6	
Category 5	Coordination/Cooperation with Construction Engineering Inspection Personnel , Property Owners, and Utilities Company	10		yes
Category 6	Mitigate Cost and Time Overruns	12		yes
Category 7	Environmental Compliance	10	2	yes
Category 8	Conformance with Contract Documents	20		
Category 9	Disadvantaged Business Enterprises (DBE) Utilization	0	4	
	Total Points:	**98 (110 w/bonus)**		

The number of points a contractor earns in each category is often based on a proportional scale corresponding to either: (1) an equivalent percentage of satisfactory work completed (being directly proportional – wherein higher percent achievement translates to higher point scores); or (2) an equivalent number of deficiency letters received (being inversely proportional – wherein a greater number of letters translates to lower point scores). To note, deficiency letters address specific issues expressed by the Resident Engineer regarding the contractor's performance.

Category 1 evaluates the contractor's performance diligence, specifically in making progress along the scheduled critical path, using all necessary resources (i.e., equipment, labor, and materials). Points are awarded in correspondence with the percentage of days in which work was pursued, with 12 points awarded for pursuing work 90% of the days, and 0 points for having pursued work at least 50% of the days.

Category 2 assesses proper coordination on the contractor's part to maximize construction operations to minimize public impact with maintenance of traffic that corresponds to specified standards. Points are awarded in relation to the number of deficiency letters submitted, with 12 points awarded for no deficiency letters, and 0 points for at least six deficiency letters.

Category 3 records the contractor's timely submission of contract documents (e.g., shop drawings, test results, MOTs, payroll, etc.). Points are awarded based on the number of deficiency letters submitted for late or insufficient submission, with 8 points awarded to timely submissions and no letters, and 0 points for four or more deficiency letters.

Category 4 addresses the timely completion of the job, with 14 points awarded for finishing within the allowable contract time (or up to 20 points for finishing within the original contract time with no weather adjustments), and 0 points for being 10% over the allowable contract time.

Category 5 regards the contractor's cooperation and coordination with CEI personnel, property owners, utility companies, and other third parties in administering contract requirements, inspecting work, or resolving issues. Points are awarded based on the number of deficiency letters submitted, with 10 points awarded for full cooperation and timely coordination and no deficiency letters, and 0 points for five or more letters for failure to coordinate and cooperate.

Category 6 deals with mitigating time and cost overruns. Specifically, with the contractor's diligence in avoiding time and cost overruns, or pursuing extensions in good faith. Points are awarded based on the number of deficiency letters submitted, with 12 points for no more than one deficiency letter, and 0 points for five or more letters noting failure to mitigate impacts.

Category 7 addresses compliance with all applicable federal, state, and local environmental regulations. Points are awarded based on the number of deficiency letters submitted, with 10 points for addressing all requirements and having no deficiency letters (or 12 points in the case of projects over 300 days of allowable contract time), and 0 points for five or more deficiency letters.

Category 8 pertains to conformance with contract requirements for product and service quality. Points are awarded based on the percentage of chargeable work days quality and/or performance concerns were addressed, with 20 points for issues addressed less than 5% of chargeable workdays, and 0 points for issues addressed more than 25% of the chargeable workdays.

Category 9 simply awards bonus points for the use of Disadvantaged Business Enterprises (DBEs), with 4 points awarded for meeting or exceeding the requirement established in the bid proposal (or if no requirement is noted, meeting at least 8% DBE utilization).