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Performance-Based Contracting for Rest Area Maintenance

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To maintain rest area stops in the United States, three methods are used. They are the In-House method, Method-Based Contracting (MBC), and Performance-Based Contracting (PBC). In recent years, the PBC method has become increasingly popular because this method reduces the strain of managing In-House employees or MBC contracts, generates more business in the public sector, can increase the level of service (LOS), and generally reduces the costs of maintaining rest area stops up to 5%.

In the United States, no less than 15 states use the PBC method to maintain their rest area stops, and the results from switching to this method of contracting has been beneficial. However, the Montana Department of Transportation (MDT) uses a combination of the In-House, MBC, and PBC methods to maintain rest area stops. The PBC method is only used at a small number of sites around the state. This research suggests that PBC would work well for maintaining all of Montana's rest area stops. Unlike the In-House method and MBC, PBC is an output based method and uses Performance-Based Specification, which focuses on the output of the work performed (Stankevich et al., 2009). With this method, a contractor is selected using the 'Best Value' or 'Qualification-Based' methods. The PBC method also offers incentives and disincentives to the contractor that are tied with the work output (Popescu, and Monismith, 2006, and Schexnayder and Ohrn, 1997).

Key Words: In-House, MBC, PBC Methods, Rest Area Maintaining.

Introduction

The MDT maintains 25,037 lane miles of road (MDT, 2014). To maintain the roads, MDT uses the In-House method and outsources to private contractors through the MBC and PBC methods. When selecting a method for maintenance, several factors need to be considered including site conditions, skilled resources availability, requirement immediate response, scope of work, budget and time constraint, complexity of the time and schedule, availability of long-term budget, transfer of risk to the contractor, increased Level of Service (LOS), packaging or bundling of maintenance activities, size of projects, duration of projects, length of projects, and cost effectiveness (Anastasopoulos et al. 2014, Anastasopoulos et al. 2010, NCHRP 2003, NCHRP 2009, Ribreau 2003, Zietlow 2004, and Zietsman 2004, Shrestha et al. 2016).

In Montana, the MDT maintains rest stops at 38 locations and manages 49 separate buildings. There are a total of 38 contracts dispersed to 30 different contractors to maintain these sites, however, the MDT only utilizes the PBC method to maintain rest area stops at 7 locations around the state. A list of the number of contracts per district can be observed in Table 1.

Table 1

The number of contracts per MDT district

MDT District	MDT Division	Number of Contracts per District
Missoula	Missoula	7
	Kalispell	1
Butte	Butte	4
	Bozeman	3
Great Falls	Great Falls	3
	Harve	3
Glendive	Wolf Point	3
	Miles City	4
Billings	Billings	8
	Lewistown	2

The MDT also uses the In-House method at two locations in Dupuyer and Sweetgrass. Due to budget limitations and a lack of prudent contractors, states often do not have enough interest to contract from the private sector. Therefore, states have to use their own employees to maintain facilities at these sites.

Literature Review

When the DOT uses the In-House method, they use their own staff and equipment for maintenance tasks. State DOTs are free to plan and execute maintenance projects because they use their own resources and personnel. Therefore, this method is used for tasks that need a quick response such as snow and ice removal (Shrestha, 2016). This method has been used in every state for maintenance and is the traditional way of performing maintenance tasks.

The MBC is also a more traditional way of contracting and uses method based specification. In this specification, a contractor is bound for 'what to do', 'when to do', and 'how to do' works (Stankevich et al. 2009). This method is employed when the scope of the work might be outside of the DOTs capacity, there is a lack of a skilled workforce, and when there are time constraints (NCHRP 2003). This method also implements the 'Lowest-Bid Method' to select a contractor for public projects, and the DOT pays the contracted party based on the bid unit rate of the task and the measurement of the work that has been completed (Shrestha, 2016).

The PBC Method is a newer method of contracting that was first introduced in British Columbia, Canada in 1988 to maintain road systems and bridges (Zietlow 2004). In contrast to the In-House method and MBC, PBC is an output based method and uses Performance-Based specification, which focuses on the output of the work performed (Stankevich et al., 2009). With this method, a contractor is selected using the 'Best Value' or 'Qualification-Based' methods. The PBC method also offers incentives and disincentives to the contractor that are tied with the work output (Popescu, and Monismith, 2006, and Schexnayder and Ohrn, 1997). Background studies show that the PBC method yields lower costs and increased LOS and is suitable for large-scale works, bundling of maintenance activities, and transferring risk from DOT to the contractors (NCHRP 2003, NCHRP 2009, Ribreau 2003, Zietlow 2004, Anastasopoulos et al. 2014, Zietsman 2004).

Objectives

The main objective of this research is to identify the best practices for maintaining rest area stops in Montana by use of performance based contracting. To collect relevant data, a national questionnaire was developed and administered to state DOT rest area maintenance personnel. This survey identifies what type of method is being used to maintain rest areas in that state, the level of satisfaction (LOS) with the methods, how performances are measured, and the lessons learned from using the methods.

Data Collection

Out of the 50 states in the US, 40 states (80%) responded to the questionnaire and were willing to provided data. Seven states used only the In-House method, eight states used strictly the MBC method, 10 states used a combination of the In-House and MBC methods, and 15 states around the country used the PBC method (Figure 1).

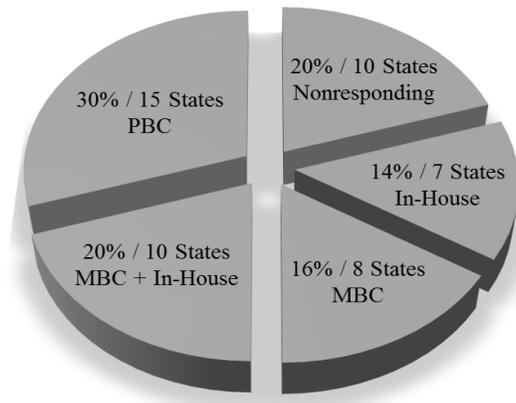


Figure 1: Use of In-House, MBC, PBC and their combination to maintain rest area stops.

Criteria for Evaluating Rest Area Stop Management

Most states implement PBC criteria by use of a rating system for maintenance performance that grades the performance of rest area maintenance personnel. A list of the generalized criteria that is used for evaluating rest area stop maintenance can be viewed in Table 2. These criteria are then evaluated and rated by a state DOT employee. These rating systems often use a point-based or percentage-based system that allows state DOT personnel to grade performance. These grades are then used to incentivize contractors. While using the PBC method, if contractors score very well they will often receive some type of incentive for excellent performance. Most times the incentive will be based on the percentage of the contract. Montana's incentives can be observed in Table 4. If Montana contractors score equal to or above 95% on their evaluation, they will be paid 110% of their contract price for that month. Inversely, if the contractor scores 80%-84.99% they will only be paid 90% of their contract price for the month.

Table 2

Criteria for Evaluating Rest Area Stop Management

Building Interior		Building Exterior			
Rest Rooms	Interior	Walks, parking, drives	Grounds/Landscaping	Building	Caretakers
Toilets, Sinks	Doors, Walls	Signs, Sidewalks	Lawn Care, Weeds	Lighting	Residence
Stalls, Urinals	Floors, Windows	Parking Areas	Trees, Shrubs	Roof	Cart Paths
Counters	Drains	Lighting	Flags, Flagpoles	Overhangs	Logs
Walls, Mirrors	Counters	Curves, Pavement	Sheds, Pet Area	Entryway	Security
Driers	Vending Area	Gutters, Ramps	Tables, Benches	Vending	
Soap	Fountains	Snow Removal	Picnic Area	Playground	
Paper Towels	Displays	Striping	Snow Removal		
Trash	Lighting	Guard rails	Fencing, Irrigation		
Fixtures	Heat/AC	Shoulders	Insect/Pest Control		
Toilet Paper	Trash, Recycling	Trash, Recycling	Trash, Recycling		

Results and Discussion

National Survey

A national survey was conducted and produced beneficial results. In the survey, the state DOTs were asked to rate their satisfaction levels on a 1-5 scale, 5 being very satisfied and 1 being very dissatisfied. Figure 2 shows the mean levels of satisfaction with the rest area maintenance methods used nation-wide. The level of satisfaction for each method was averaged out of the 40 states that responded to the questionnaire. The two methods that produced the highest level of satisfaction were the PBC and In-house methods.

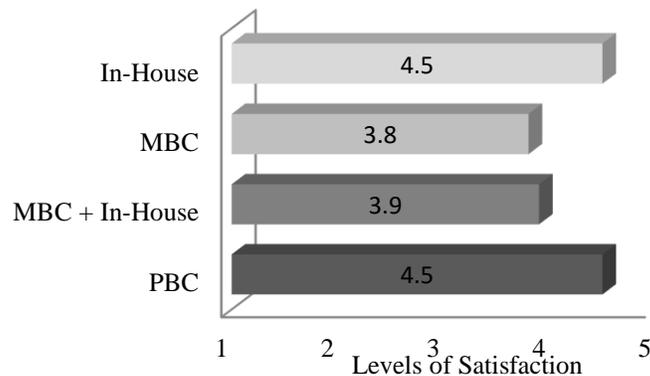


Figure 2: State DOT's Level of Satisfaction with the Maintenance Methods.

There are several reasons for transitioning to the PBC method (Figure 3). Cost saving was the most prevalent reason to change to the PBC. Of the 15 states that switched to the PBC method, 6 state reported financial data (Table 3). Five of the six states who conveyed financial data, reported a reduction in cost from 1% to 15%. However, Nebraska reported a 5% to 10% increase in cost. Other reasons for transitioning include a reduction in the strain of management, initiate a Public Private Partnership (PPP), private sector interest, the ability to bundle multiple contracts into a single contract, ease with which to fulfill the compliance requirements for water and waste water systems, inspections can be regulated, and 12 to 24 hour services can be offered.

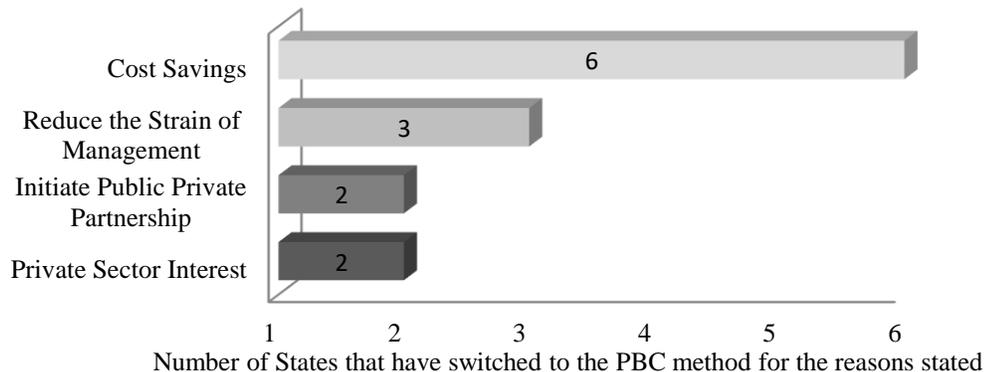


Figure 3: Main Reasons for switching to the PBC Method.

Table 3

Cost Reductions and Increases for States that Reported Financial Data

State	Cost Reduction
Indiana	1% - 5%
Michigan	1% - 5%
Missouri	1% - 5%
Nebraska	-5% - -10%
North Carolina	10% - 15%
Pennsylvania	5% - 10%

Advantages and Disadvantages of Using the Methods

When collecting data from state DOT personnel, several advantages and disadvantages resulted from using the In-House method. The top three advantages based on number of respondents include: a) Management has more control over their employees and projects (3 states), b) The In-House employees are most likely more experienced (5 states), and c) Possibly better response times to problems (2 states). Similarly, the top three disadvantages include: a) Lack of funding (10 states), b) limited personnel available for DOT projects, hard to staff, high employee turnover rate (5 states), and c) Employee's personal problems (4 states). There are not enough resources to provide 24 hour services including security (3 states). When collecting data, several advantages and disadvantages resulted from using the MBC method. The top three advantages include: a) Fewer In-House employees (8 states), b) MBC can possibly be more cost effective (3 states), and c) A good contract can be beneficial for the state and the private contractor (2 states) / Government personnel can be used for more important tasks (2 states). Similarly, the top three disadvantages include: a) Lack of funding (7 states), b) Lack of healthy competition to negotiate a contract that is beneficial (2 states), and c) The risks of not fulfilling the obligations of the contract, lower levels of service (LOS) (4 states). When collecting data, several advantages and disadvantages resulted from using the PBC method. The top three advantages include: a) Save money and increase the level of service (10 states), b) Implement Public Private Partnerships that involve community based programs (5 states), c) increase private sector business and reduce the strain of managing In-House employees and/or MBC contracts (3 states)/Shift the risk of managing rest area stops from the government to the contractor (2 states). Similarly, the top three disadvantages include: a) Lack of funding for contracts can sometime impede the implementation of PBC (4 states), b) Weak contractors can produce a poor level of service and can sometime be very costly (4 states), and c) Lack of competition to negotiate a beneficial contract (2 states).

Lessons Learned

Several lessons were learned from state DOT personnel involved with states that implemented the PBC method. PBC has its challenges, however, one thing that can be learned is that it is best to concentrate more time on writing the contract in a way that gives the expectation rather than telling the contractor how execute the contract. There is a need to have detailed contracts that thoroughly explain everything that has to be done and have methods built in the contracts to fine contractors that are underperforming. In addition, DOT managers must be sure performance measures are well thought out and appropriate to achieve the performance desired. Separate contracts for grounds maintenance and janitorial also provide a better level of service in each of these facets of maintenance. During the bidding process, make sure several companies come to bid and provide quotes as soon as possible. When transferring to the PBC method, all parties, including the DOT and the contractor, must understand how PBC works.

PBC is also easier to manage because the measured items are either pass or fail. There is no in between. However, department managers must manage the contract and contractor to attain the proper level of service. This is where the state DOT should incorporate some type of procedural guidance, such as a maintenance manual. The DOT must also clearly define the consequences for failure to perform (deductions), which will make the evaluation process clear when the assessment is performed. In addition, when assessing contractors, do not allow them perform under expectation for any reason at any time. Any allowances will lead to more expectations of greater allowance and will

give the interpretation that it is not really that important to meet performance measures. The PBC model will fail if a contractor (or the Department) has the mindset of reactive work rather than proactive work.

The PBC method also makes it easier in dealing with a vendor that is not performing. Since PBCs have penalties for nonperformance, the contract is easier to enforce than other non-PBC contracts and this tends to get a contractor to perform better than other methods.

Author's Suggestions

Due to budget limitations, the MDT needs to maintain its road system components as cost effectively as possible. Therefore, the MDT should employ the PBC method in procuring all maintenance contracts. The PBC method would be more suitable due to the DOTs increasing workload and limited personnel. However, pilot programs implementing the PBC method have reportedly not achieved the desired results. The MDT reported that the PBC method has been more expensive than the MBC method at the same locations because PBC contractors have been receiving their incentive almost every time which increased the price by 10%. This could be for several reasons. Grading can sometime be skewed by bias during an evaluation. The MDT reported that graders do not want to give contractors poor scores because they do not want to be the person who denies money to the contractor. This is unacceptable for graders. Grading needs to be standardized and unbiased. Several alternatives are available that might reduce the amount of bias during grading and improve the overall incentive program. Right now, if contractors are evaluated at 95% or greater, they will receive 110% of their monthly contract payment (Table 4). Since contractors seem to be getting their incentive almost every time, a harder grading system is prudent. The suggested incentive program can be seen in Table 5. This version of the incentive program would only give 105% of the monthly contract payment if the contractor is evaluated at 98% or greater. This method makes it more difficult for contractors to receive their positive incentive because this program would require a higher level of performance. More stringent criteria and guidelines for grading could also be implemented. If the contractor is going to receive more money, that contractor should have to provide more services.

Table 4

MDT Incentive Program for Rest Area Maintenance

	DESIRABLE	ACCEPTABLE	NEEDS IMPROVEMEN	POOR	UNACCEPTABLE
Score	95% or Greater	85% - 94.99%	80% - 84.99%	75% - 79.99%	Less than 75%
Monthly Payment Multiplier	110% / Month	100% / Month	90% / Month	80% / Month	50% / Month

Table 5

Suggestive Incentive Program Rest Area Maintenance

	DESIRABLE	ACCEPTABLE	NEEDS IMPROVEMEN	POOR	UNACCEPTABLE
Score	98% or Greater	85% - 96.99%	80% - 84.99%	75% - 79.99%	Less than 74.99%
Monthly Payment Multiplier	105% / Month	100% / Month	90% / Month	70% / Month	50% / Month

The MDT has also reported that using the In-House method produced a higher level of service. This is another reason why contractors need to be graded more strictly and performance guidelines need to be altered to produce better services. To receive an incentive, contractors must provide a higher level of service than they were when getting 100% of their contract price.

The way incentives are paid to the contractor could also have an effect on the performance. Instead of giving incentives on a monthly basis, perhaps a quarterly or yearly incentive program might work better, where the incentives are rated over a longer period of time. This method would keep performance at higher levels for longer periods of time. If a contractor receives the incentive over a longer period of time, this contractor will have to keep performance at a higher level for a longer period.

Another method that could be changed to benefit rest area maintenance procedures would be the use of district wide contracts. Ideally, a single contract to maintain all rest stops in the state by a larger company would be preferable. However, due to Montana's size and sparse population, there is not enough competition or interest to employ one contract for maintaining all rest stops around the state. Most districts in the state of Montana employ three to eight contracts. Therefore, the MDT may be able to negotiate a more beneficial contract that has the capacity to maintain all the contracts in a district.

The DOT's ability to write contracts is also very important. Several states around the country reported that weak contracts resulted in higher costs and much confusion. If a contractor is not sure what they are supposed to be doing, then that contractor will most likely not be performing all the tasks necessary for proper maintenance. Contracts need to clearly define everything that is the contractor's responsibility as well as the state DOT's responsibility. When tasks are not clearly stated to the contractor, the contractor will probably not perform those tasks.

Urgency and Expected benefits of using PBC method

Research has shown that the PBC method saves money when used to maintain rest area stops around the country. When there are less administration costs, state DOT personnel only need to be concerned with the performance of the contractor and the end results. This method is also much easier to manage because it is output based. There is no input when managers use PBC; managers only need to worry about the performance of the contractor and the end result. Managers do not have deal with as many employee problems because there are less In-House employees to manage. In addition, since there are less DOT personnel working on rest areas, they are free to work on other, more important DOT projects.

When using contractors, risk is also shifted from the state to the contractor. This works out well because the state is not as liable as it was when employing its own personnel. Some states also reported a lesser frequency of inspection and accounting than for MBC. Additionally, if multiple contracts can be bundled into one contract that encompasses an entire district, even more money could be saved.

When contracting, there is also no hiring and firing process for employees. In several states, this is a very large problem. In many places, there is little interest in jobs such as rest area janitors. Therefore, the hiring process can be very difficult and can sometimes be very long. Some states reported that it can take months to fill some of the positions available at rest areas. Therefore, it is better to eliminate the hiring and firing process for jobs relating to state DOT rest area maintenance.

When using PBC, more innovation can be developed and more services can be offered. Sometimes services such as security and full-time staffing can be offered by private companies. Better managed facilities then lead to a higher level of customer satisfaction and a greater LOS for the people using rest areas.

Not only does contracting provide more private sector jobs, community-based rehabilitation programs can also be used. Programs such as this have been very successful in states such as Florida and Minnesota. Not only are more jobs provided, they are also employing people that are difficult to employ in different professions and sometimes desperately need the job.

Conclusions and Recommendations

The PBC method should be used to maintain all locations around the state of Montana. On average, the PBC method saves up to 5% on costs related to maintaining rest area stops. With this method, a contractor is selected using the 'Best Value' or 'Qualification-Based' methods (Popescu, and Monismith, 2006, and Schexnayder and Ohrn, 1997). Alternative incentives programs have been suggested that could work better for the MDT.

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