

# Performance-Based Contracting for Maintaining Rest Area Stops

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To maintain rest area stops in the United States, three methods are used: the In-House method, Method-Based Contracting (MBC), and Performance-Based Contracting (PBC). Unlike the In-House and the MBC methods, the PBC method is an output-based method that uses performance-based specification, which focuses on the output of the work performed. In recent years, the PBC method has become increasingly popular. The purposes of this study are to identify the best practices for rest area maintaining, evaluate existing criteria, save cost with using the PBC method, identify reasons for switching to the PBC method, and identify lessons learned from using the PBC method. A survey was conducted with state Departments of Transportation personnel to collect in-depth information regarding rest area maintaining. Results show no less than 15 states use the PBC method to maintain their rest area stops. Across Montana, the PBC method is used at a small number of locations. Switching to this method has been beneficial since using the PBC method reduces the strain of managing contracts, generates more business in the public sector, increases the Level of Service, and reduces the costs of maintaining rest area stops. This study also suggested for the modification of existing incentive program.

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

## Introduction

The Montana Department of Transportation (MDT) maintains 12,946 miles of state highway systems every year (MDT, 2017). To maintain the road facilities, MDT uses the In-House method; it also outsources to private contractors, through Method Based Contracting (MBC) and Performance Based Contracting (PBC). When selecting a contracting method, several factors need to be considered. They are site conditions, skilled resources availability, immediate response, scope of work, budget and time constraints, work complexity, availability of long-term budget, risk transfer, increased Level of Service (LOS), bundling of maintenance activities, project characteristics, and cost effectiveness (Anastasopoulos et al., 2014; Anastasopoulos et al., 2010; NCHRP, 2003; NCHRP, 2009; Ribreau, 2003; Zietlow, 2004; and Zietsman, 2004; Shrestha, 2016). With the PBC 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.

Background studies show that the PBC method yields various advantages. They include lowering costs, increasing LOS, transferring risk from state Department of Transportation (DOT) to the contractors, as well as the PBC method is suitable for large-scale works and this method allows bundling of road maintenance activities (NCHRP, 2003; NCHRP, 2009; Ribreau, 2003; Zietlow, 2004; Anastasopoulos et al., 2014; Zietsman, 2004).

In Montana, the MDT maintains rest area 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 seven locations across the state. Table 1 shows the 38 contracts under various MDT divisions and districts. The MDT also uses the In-House method to maintain rest area stops. Due to budget limitations and a lack of resources, MDT is using the In-House method for maintaining rest area stops in two locations in Dupuyer and Sweetgrass in 2017/2018.

Table 1

*The number of contracts per MDT district*

MDT Districts	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 main objective of this study is to identify the best practices for maintaining rest area stops in Montana,; to identify the advantages and disadvantages of using the In-House, MBC, and PBC method; to identify the criteria to evaluate rest area stops; to determine the cost savings with using the PBC method; to determine reasons for switching to the PBC method; to identify level of satisfaction with using three types of rest area maintaining methods; and to identify lessons learned from using the PBC method. To collect the in-depth information regarding the rest areas, a national survey was developed and administered to state DOT rest area maintenance personnel.

### Literature Review

When the DOT uses the In-House method, it uses its own staff and equipment for maintenance tasks. With the In-House method, state DOTs are free to plan and execute maintenance projects. Therefore, this method is used for tasks that need a quick response, such as snow and ice removal (Shrestha, 2016). With the In-House method, the state DOT staff are paid at regular monthly basis. This method has been used in every state for maintenance and is the traditional way of performing maintenance tasks.

The MBC is a traditional contracting method and uses method-based specification. In this specification, a contractor is bound by ‘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 DOT’s 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 & Monismith, 2006; Schexnayder & Ohn, 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; Shrestha et al., 2017a; Shrestha et al., 2017b).

## Data Collection

Out of the 50 states in the United States, 40 individuals from 40 states (80 percent) responded to the questionnaire. Seven states used only the In-House method, eight states strictly used the MBC method, 10 states used a combination of the In-House and MBC methods, and 15 states across the country used the PBC method (Figure 1).

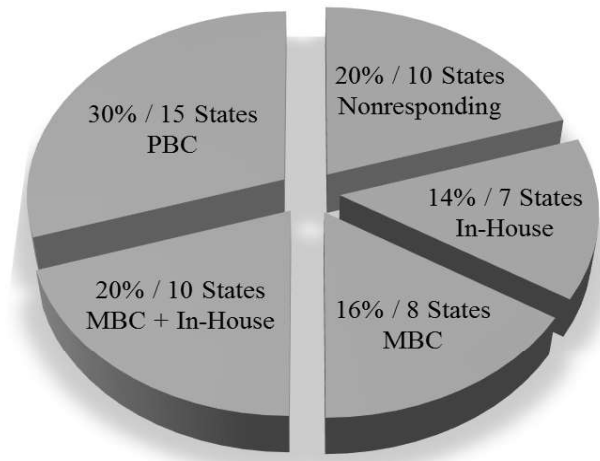


Figure 1: Use of In-House, MBC, PBC and their combination to maintain rest area stops.

## Criteria for Evaluating Rest Area Stop Management

Most states implement PBC criteria by use of a rating system to maintain their rest area stops. The rating system evaluates the performance of rest area maintenance works. A list of the generalized criteria that are used for evaluating the performance of rest area maintenance work is presented in Table 2. These criteria are then evaluated by state DOT personnel based on rating system. These evaluation systems often use a point-based or percentage-based system to evaluate performance of the work. The evaluation grades are then used to provide incentives/disincentives to the PBC contractors. If a PBC contractor scores higher than the minimum required the contractor will often receive some type of incentive. Most times the incentive is based on the percentage of the contract. Montana's incentives are presented in Table 4. If Montana contractors score equal to or above 95 percent on their evaluation, they will be paid 110 percent of their contract price for that month. Inversely, if the contractor scores 80 percent - 84.99 percent, they will only be paid 90 percent of their contract price for the month.

Table 2

### Criteria for evaluating rest area stop management

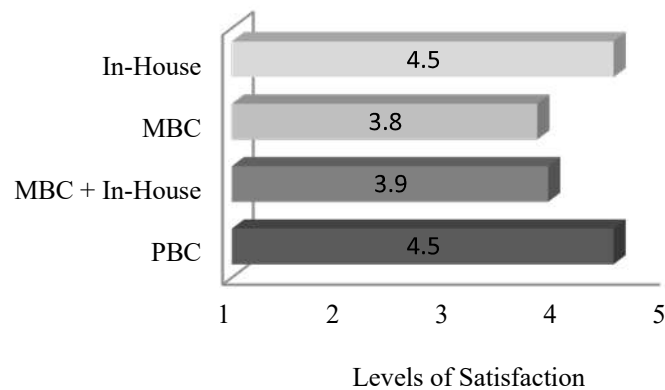
Building Interior		Building Exterior			
Rest Rooms	Interior	Walks, parking, drives	Grounds/Landscaping	Building	Caretakers
Toilets, Sinks	Doors, Walls	Signs, Sidewalks	Lawn Care, Weeds	Lighting	Residence
Stalls, Urinals	Floors, Windows	Parking Areas	Trees, Shrubs	Roof	Cart Paths
Counters	Drains	Lighting	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*

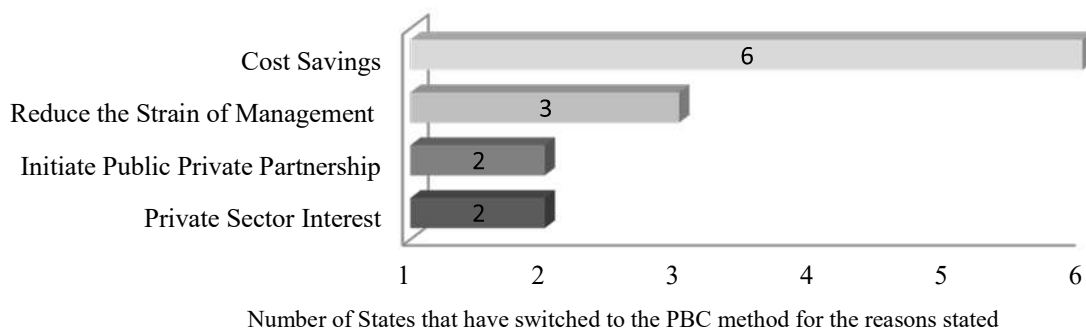
The national survey includes questions relating to the type of methods used for rest area maintaining, the satisfaction level of DOT personnel with using the methods, the cost savings with using the PBC method, the reasons for switching to the PBC method, the level of satisfaction with using three types of rest-area maintaining methods, and the lessons learned from using the PBC method.

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 survey. The two methods that produced the highest level of satisfaction were the PBC and the 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 shows the main reasons. The result shows that cost savings was the most prevalent reason. Of the 15 states that switched to the PBC method, six states provided financial data regarding cost of rest areas (Table 3). Five of the six states that provided the cost data reported a reduction in cost from 1 percent to 15 percent. However, Nebraska reported a 5 percent to 10 percent increase in cost. Other reasons for transitioning include reduce the strain of management, initiate a Public Private Partnership (PPP), have private sector interest, allow to bundle multiple contracts into a single contract, ease to fulfill the compliance requirements for water and waste water systems, regulate inspections, and offer 12 to 24 hour services.



*Figure 3: Main reasons for switching to the PBC method.*

Table 3

*Cost Reductions for States that reported financial data*

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

*Advantages and Disadvantages of Using the Methods*

In another question, state DOT personnel were asked about the advantages and disadvantages that resulted from using the In-House, MBC, and PBC methods. The top three advantages with using the In-House method were a) management has more control over their employees and projects, b) the In-House employees are most likely more experienced, and c) quick response to problems. Similarly, the top three disadvantages were a) lack of funding; b) available limited personnel, hard to staff, and high employee turnover rate; and c) employee's personal problems. With using the MBC method, the top three advantages were a) fewer In-House employees, b) cost effective, and c) a good contract can be beneficial for both parties. Similarly, the top three disadvantages were a) lack of funding, b) lack of competition to negotiate a contract, and c) the risks of not fulfilling the obligations of the contract and lower levels of service (LOS). With using the PBC method, the top three advantages were a) cost effective and higher LOS, b) implement PPP that involve community based programs, and c) reduce the strain of managing In-House employees and/or MBC contracts and shift the risk of managing contracts to the contractor. Similarly, the top three disadvantages were a) lack of long-term funding for PBC contracts, b) weak contractors can produce a lower LOS, and c) lack of competition to negotiate a beneficial contract.

*Lessons Learned*

The respondents were also asked to share the lessons learned from the experience of using the PBC method. The high frequency lessons learned were

- a) The state DOT personnel shall concentrate on writing a contract in such a way that gives expectations clearly rather than mentioning to the PBC contractors how to execute the contract.
- b) There should be separate contracts for grounds maintenance and janitorial. It also provides a better LOS in each of these facets of maintenance.
- c) During the bidding process, make sure several companies come to bid and provide quotes as soon as possible.
- d) When transferring to the PBC method, all parties, including the state DOT and the contractor, must understand how PBC works;
- d) The state DOT personnel must also clearly define the consequences for failure to perform (deductions/disincentives), which will make the evaluation process clear when the assessment is performed; and
- e) The PBC model may fail if a contractor (or the Department) has the mindset of reactive work rather than proactive work.

*Author's Suggestions/ Recommendations*

Due to budget limitations, state DOTs need to maintain their road system facilities as cost effectively as possible. In the case of the MDT, it is suggested to employ the PBC method in procuring all maintenance contracts that are suitable for PBC method (Shrestha et al., 2017b). The PBC method would be more suitable to the DOTs for increasing workload and limited personnel. However, in Montana, the pilot programs implementing the PBC method have reportedly not achieved the desired result of cost savings. This could be for several reasons. Grading

by DOT personnel can sometimes be skewed by bias during an evaluation. 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: for example, third-party grading. With the present incentive programs that MDT is using for PBC pilot projects, 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 month, the present incentive program should be modified so that with the modified program, the PBC contractor must increase the LOS of its service significantly. 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.

Table 4

***MDT incentive program for rest area maintenance***

<b>Description</b>	<b>Desirable</b>	<b>Acceptable</b>	<b>Needs Improvement</b>	<b>Poor</b>	<b>Unacceptable</b>
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

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 contractor than the existing contractors 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 across 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.

### **Expected Benefits of Using the 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. Managers only need to monitor the end result of the PBC contractor. In addition, since there are less DOT staff working with PBC rest area contracts, the administrative cost of the MDT should decrease. .

When using contractors, risk is also shifted from the state to the PBC 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 the MBC. Additionally, if multiple contracts are 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 considerable problem. In many places, there is little interest in jobs such as rest area janitors. Therefore, the hiring process can be difficult and sometimes 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 successful in states such as Florida and Minnesota. Not only are more jobs provided, the people with limited employment prospected are employed.

## Conclusions and Recommendations

A survey was conducted with state department of transportation personnel to collect in-depth information regarding rest area maintenance. Out of 50 state departments of transportation (DOTs), 40 states responded resulting in an 80 percent response rate. The results show more than 15 states use the Performance-Based Contracting (PBC) method to maintain their rest area stops. In Montana, the PBC pilot projects were started in seven locations to maintain the rest area stops. With the national survey, a number of criteria were identified for evaluating rest area stops. The national survey result also indicated that the DOT personnel were highly satisfied with using the PBC and the In-House methods. The two main reasons for switching to the PBC method were cost savings and reducing management strain. The results from switching to the PBC method have been beneficial and saved costs up to a maximum of 15 percent. Another important advantage of using the PBC method was reported as increased Level of Service (LOS).

The respondents shared the lessons learned from their experience with using the PBC method. Preparing a clear output-based contract and having separate contracts for facility maintenance and janitorial services were reported as high-priority lessons learned. This study also suggested some recommendations. Two main recommendations are a) the Montana Department of Transportation (MDT) should modify the existing incentive (evaluation) program and b) the contractors' performance evaluation should be conducted by a third-party evaluator.

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