Factors Potentially Influencing Productivity in Performance-Based Maintenance Contracts (PBMC) – An International Study of Roads from Sweden

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By Pekka Pakkala

ABSTRACT

Measuring productivity of the maintenance contractors is extremely difficult and not practical under existing scenarios. It would be more advantageous to determine what factors potentially influence productivity of the maintenance contractors, especially with Performance-Based Maintenance Contracts (PBMC). Sweden commissioned this study to determine practices in progressive countries involved in PBMC and how productivity can be influenced. The objective was to determine what factors potentially influence the productivity of the maintenance contractors and what actions can clients (agencies) consider. Additionally, it was intended to find potential solutions and investigate better practices that affect or influence productivity.

The study approach consisted of a literature review and semi-structured interviews in six different countries consisting of Sweden, Finland, The Netherlands, England, Ontario, Canada, and the Virginia Departments of Transportation, in the USA. Each country responded to questionnaires concerning productivity factors.

The results show that no clients included in the study measure the contractor’s productivity in PBMC. Competition for maintenance services is the primary factor to influence productivity and by using a performance based approach in a hybrid-type PBMC. Other factors identified include a more balanced risk approach, longer term agreements, bundling services, optimized service area, and using as much performance requirements as possible. The study showed that productivity of the maintenance contractor’s is complex and difficult to assess, but can be influenced indirectly by various factors. Also, there are options that practitioners can possibly adapt to help improve the productivity and efficiency by seeking solutions elsewhere.
INTRODUCTION

This international study titled “Factors Potentially Influencing Productivity in Performance-Based Maintenance Contracts (PBMC)” – An International Study of Roads originated from “Sweden’s Productivity Committee” and was performed by Aalto University’s, School of Engineering, Department of Civil and Environmental Engineering in Finland.

This international study involves determining issues and factors influencing the productivity of the road maintenance contractors. The main purpose of this project was to identify factors potentially influencing the productivity of the road maintenance contractors and summarize good practices, lessons learned, and issues that relate to procurement. The countries selected in this study are as follows:

- England
- Finland
- The Netherlands
- Ontario, Canada
- Sweden
- In USA: Virginia Department of Transportation

Due to the small sample size, this is not considered as an exhaustive study. Funding for the project did not allow a quantitative measurement, but more of a qualitative approach through semi-structured interviews supplemented by a literature review. The duration of this project was from December 2010 through November 2011. Considering the time constraints, it was chosen to use a rather thoughtful analysis of the most significant aspects related to PBMC and productivity. The results are presented in the paper and it is hopeful that other practitioners can benefit from the findings.

This study is not aimed at productivity measurements or statistics, but mainly at how productivity relates to maintenance contracting.

Background

This productivity study was established by Sweden’s Productivity Committee in order to gather an understanding of how clients/agencies (using clients from this point forward) influence productivity and experienced by other countries that are using Performance-Based Maintenance Contracts (PBMC). There was a concern that the productivity levels in the construction sector in Sweden were in general weak, lagging behind other sectors and needed further examination. Therefore, an international study was initiated to examine issues related to productivity. Productivity is generally reported in terms of productivity of the entire construction sector and not specifically for road maintenance. The true results of productivity are indeterminate and virtually impossible to measure as there are not any systems used to collect the data under present scenarios.

Several countries have been outsourcing the maintenance services to gain efficiencies, cost savings, and reduce the administrative burden. It was important to seek a different approach in this study by examining practices and factors more profound to promoting productivity. It is necessary to uncover those details that potentially influence productivity and which approaches encourage better performance. Once the findings are available then the best practices may be implemented into the existing framework.
Methodology
The research methodology was to gather resources through published reports, technical papers, internet searches, and with experts in the industry. Semi-structured interviews with the respective road authorities (agencies) were the main source of data collection and a custom-made questionnaire with an open ended approach was used. The interviewees were given freedom to express their views on the matter and were kept informal to suggest their qualitative experiences. Additionally, the interviewees could enlighten other issues, which gave the interviewer possibility to ask additional questions. The intent was to capture the recent practices and to obtain a comprehensive picture. The interviews were conducted in private meetings and occurred during January through June in 2011. Telephone interviews with professionals were included to add value on productivity related issues. In addition, the author’s previous studies formed an overall addition to the report (1) and (2).

Objectives
The objective of the study was to determine what issues can potential increase or decrease the productivity of maintenance contractors and issues in the public procurement process. The research objectives are summarized as follows:
• To identify the types of practices used in other countries
• To determine the benefits, challenges, & issues with alternative methods
• To determine arguments used for differing practices or models
• To identify factors that contribute to productivity & innovation
• To determine the lessons learned in other countries

The expected/predicted benefits are that the outcomes will identify new approaches that may be implemented as a catalyst for increases in productivity. Some of the other expected results include:
• Determining methods that have better results
• Determining factors that potentially increase productivity and efficiency
• Can there be any Key Performance Indicators (KPIs) relating to productivity?
• What are the challenges for implementation

The intent was to discover the most recent practices, discuss some of the lessons learned, and attempt to decipher what factors might potentially influence productivity in the road sector.

BACKGROUND INFORMATION ON MAINTENANCE
Maintenance is defined as the act of fixing or replacing things as opposed to constructing or building things. Routine maintenance is defined as those activities that occur annually or on a cyclic nature and some examples are as follows:
• Winter maintenance (snow plowing and deicing)
• Summer maintenance (grass mowing, vegetation control and trash removal
• Drainage and culverts
• Crack and Pothole repair
• Various types of cleaning (roads, signs and etc.)
• Routine gravel road maintenance
• Shoulder repair
• Bridge cleaning and possibly inspection
• Line marking
• Guard rail repair/replacement
Most countries in this study are typically using or have used some form of Performance Based Maintenance Contracts (PBMC). PBMC is defined as a maintenance concept where a private service provider is responsible for the maintenance and management of assets to a predefined set of conditions or service levels. One challenge to performance specifications or functional specifications is the need for robust data (3) and determining the best performance measures. Most countries are using some model variations of PBMC, but there are various terminologies used around the world that essentially refer to the PBMC approach. The main point is that there are various terminologies used for outsourcing of maintenance services that usually adopt a performance-based approach. Some recent terminologies used are identified as:

- Performance Based Maintenance Contracts (PBMC)
- Performance Based Service Agreements (PBSA)
- Managing Agent Contracts (MAC)
- Alliance Contracts or eMAC (enhanced MAC)
- Area Maintenance Contracts
- Performance Contracting
- Total Contract Maintenance
- Turnkey Asset Maintenance Services (TAMS - VDOT)
- Integrated Service Agreements (ISA – Australia and New Zealand)

Figure 1 shows examples of differences between traditional outsourced contracts and Performance Based Maintenance Contracts. This figure highlights some of the main features.

**FIGURE 1 Comparison between Traditional Versus PBMC**

<table>
<thead>
<tr>
<th></th>
<th>Traditional (Method Based)</th>
<th>PBMC (Outcome Based)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk Sharing</strong></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Contract Duration</strong></td>
<td>1 year</td>
<td>3-11 years</td>
</tr>
<tr>
<td><strong>Keep Control</strong></td>
<td>By Client</td>
<td>By Contractor</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td>By Client</td>
<td>By Contractor</td>
</tr>
<tr>
<td><strong>Less Management</strong></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Admin. of Work</strong></td>
<td>By Client</td>
<td>By Contractor</td>
</tr>
<tr>
<td><strong>Innovation</strong></td>
<td>Minor</td>
<td>Potential</td>
</tr>
<tr>
<td><strong>Savings</strong></td>
<td>No</td>
<td>Potential</td>
</tr>
<tr>
<td><strong>Complaints</strong></td>
<td>By Client</td>
<td>By Contractor</td>
</tr>
<tr>
<td><strong>Planning/Staffing</strong></td>
<td>By Client</td>
<td>By Contractor</td>
</tr>
<tr>
<td><strong>Reliance on Asset Management</strong></td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
PRODUCTIVITY ISSUES AND DISCUSSION

Maintenance projects significantly differ from capital projects and the productivity of maintenance work is not measured by any country in this study. A productivity measure is therefore not available and it is virtually impossible to measure productivity for maintenance under existing scenarios. It may be possible to measure the performance of maintenance contractors through a performance measurement approach (time and response measurements and asset condition), but not the actual productivity. The main focus therefore was to determine factors that potentially influence productivity used in maintenance contracts.

According to the literature review, productivity is defined in many ways and many times not interpreted in the same manner. Sometimes productivity is broadly described in terms of efficiency, effectiveness, performance, and even profit. In the manufacturing industry productivity is fairly well recognized and is typically described as the relation of output to all inputs. Increases in productivity are generally favored and decreases are typically frowned upon.

The biggest challenge is that the clients are not directly measuring the productivity, but are generally accomplished indirectly by other governmental organizations. Even then, the productivity is a representation of all construction types and not individual maintenance statistics (4). Other challenges include; are we measuring the right attributes, are the data accurate, is the definition used and understood by all, is it a fair comparison when benchmarking one industry against other industries, at what level do you measure productivity, is it possible to determine productivity impacts using different procurement methods, and are you able to determine what caused true productivity to increase or decrease.

Productivity in this study is defined as the value of output divided by the value of all inputs. If value can be added or increased into the numerator of the productivity equation, then there should be productivity gains. Likewise, if the denominator can be reduced (more for less), then there are productivity gains too. So the real challenge is how to get more value or at less cost, so that productivity can increase, since most projects have fixed budgets.

Productivity is certainly an issue that will continue to be discussed and debated. It should be objectively utilized and standardized in order to compare comprehensively. If it cannot, then productivity figures are suspect and comparisons are virtually impossible using the present systems.

RESULTS FROM MAINTENANCE INTERVIEWS

There was a noticeable variation in the implementation and amount of performance-based requirements used in the contracts. The hybrid model (combination of performance requirements and method based) seems to be the most common approach as it is difficult to have all measures defined in terms of outcomes or performance-based criteria.

Most countries are using PBMC for routine maintenance, and three countries include resurfacing into the contract using fixed unit prices. Area based contracts are the most common practice as it is easy to quantify the amount of work in a certain road network area. Virginia DOT in the USA is the only country in the study using a corridor approach.

How Infrastructure Clients Affect Productivity

Clients are not able to tell the contractors directly to be productive and are usually accomplished through the terms and conditions in the publicly tendered contracts. Indirectly the clients can also communicate their wishes to improve contractor’s productivity through close communications, sharing of ideas, and some loose forms of client-contractor activities or associations.
Open (head-to-head) competition is probably the best way to improve productivity, efficiency and cost savings. Even if a certain model might be potentially more advantageous, the productivity gains are not automatic. There is no guarantee that productivity will be increased, but allows the opportunity for higher degree of performance, efficiency, better practices, and therefore may positively influence productivity. It is also important to understand what practices are used and why? It is important to obtain a comprehensive understanding of what models are available and which ones produce better outcomes or benefits.

The main influence on productivity is to choose the best/optimum maintenance contract model. In most cases the works or construction has been introduced into competition for a long time. Maintenance contracting is the recent or new market. Having a functional and healthy market is very important and especially for future competition. This can be done in many ways and each country included in this study had used different approaches to PBMC. The success varies from country to country and some have achieved significant savings.

Factors Potentially Contributing to Productivity
One survey question was to determine factors “in general” contribute to the productivity. During the course of the study, there were many general factors identified that potentially influence the productivity of maintenance service providers. These factors from the interviews are as follows:

• Open and functional competition (Head to head competition)
• Using a performance-based approach
• Longer term contracts (greater than five years)
• Bundling of activities (integrated services - economies of scope)
• Larger area contracts (economies of scale)
• More flexibility (e.g. yearly replacement plan)
• Incentives and disincentives
• Measuring the performance of the service providers
• Risk balancing and clearly defined in the contract (consider sliding scale risk)
• Using modern, interchangeable and intelligent equipment
• Pro-active asset management
• Use of GPS and ICT systems (for quality and efficiency)
• Fewer restrictions (client added administration and practices)
• Standardization broadly applied
• Good project management
• Partnering – indirectly
• Identification of non-planned work (and additional work)
• Optimum salt usage
• Flexible payment plans versus constant monthly payments (expedite work)
• Encouraging innovation (difficult in practice without a reward scheme)
• Developing a past performance rating system
• Stipulation of in-house work performed by the main contractor (e.g. ~25%.)

Functional Market
It is very important to have a functioning market of maintenance service providers, because a monopoly is not desired as was done in the past when performed in-house by the client.
organizations. There must be open head-to-head competition among the service providers. The road maintenance market in many countries is considered an oligopoly where there are typically on average about 3–5 bidders (5) for maintenance contracts. Since maintenance services are required on a cyclic basis, it is important to also maintain a functioning market into the future. This should be studied on an ongoing basis and should be evaluated on an on-going basis.

_main factors_

The main factors influencing productivity in the PBMC are a performance based approach (6), long-term agreements, bundling of activities, larger area contracts, providing flexibility for long lead items (preservation systems), including incentives and disincentives, measuring the contractor’s performance, balancing the risks (described in later section), and newer high-tech equipment. These factors all have the greatest influence, but again it is not known how much each factor influences the overall productivity and it will vary from case to case.

The use of incentives and disincentives often led to productivity gains, but very few have used these concepts. It is difficult to use a reward scheme in maintenance contracts, possibly due to the lack of objective measuring schemes. It is also more difficult to implement incentives and disincentives mainly due to the budget restrictions and which rewards drive the correct behavior.

_Maintenance Asset Management_

Pro-active asset management is another important challenging issue. This assumes that you have automated tools and systems for decision making. Collecting the asset condition data is important as well as the ability to use the data to make good and pro-active decisions. One of the challenges is to predict or estimate time to failure of the assets. One purpose of maintenance is extending the service life to its functional limits, which can be very difficult to determine in advance. This in essence requires good asset management practices and having automated systems that measure the asset conditions, so that the maintenance services are efficiently and effectively delivered. It would be beneficial to have a Life Cycle Costing (LCC) system in place. Asset management systems are important and may be take time, resources, and re-engineering. The benefits and return on investment often take time to be rewarded.

Since there is no systematic evaluation, it is difficult to determine which aspects have the greatest influence toward productivity. Most contracts were implemented using many of these factors, so it is virtually impossible to determine a quantitative value from each variable.

_factors in maintenance contracts potentially decreasing productivity_

There are also factors that contributed to decreasing the productivity, which could be due to additional requirements in administration or management. The factors that potentially decrease productivity are as follows:

- Cultural change required in the client organization (internal resistance)
- Prices are being squeezed and less additional work included for compensation
- Restrictive requirements on the use of certain equipment and materials
- Inability to accept proposed innovations (possibly proprietary)
- Additional requirements placed upon the contractor (requiring several project managers)
- Lack of skilled workforce
- Not maximizing the usage of labor and equipment
- Extra work required adding data into Maintenance Management Systems (MMS), and the need for better integration of web based systems
Traditional Culture

A “stove-piped” or traditional culture exists in many client organizations and sometimes within the construction industry. There is a long standing history of doing things a certain way and often requires change management principles to overcome. This also applies to contractors, but is more noticeable in client organizations.

Many countries still resist the notion of outsourcing maintenance services to the private sector and rely on own workers to perform the services. This traditional approach is challenging to breakup and requires a paradigm shift. Outsourcing on the other hand requires a functioning market and a shift of being the service provider to being a steward of the maintenance services.

Lower Budgets

There is significant pressure to reduce the prices for maintenance services, and governmental authorities typically apply budget cuts to maintenance as a first choice. This is not a wise decision as it is important to keep the existing assets in good condition. This could potentially have a negative effect if maintenance is withheld and there is a continuing backlog of assets to be repaired.

Many countries are in their second, third, or fourth generation of contracts and it is difficult to find further reductions to prices. In Ontario, Canada the contract duration has now advanced further than others and is 10-13 years, which includes resurfacing as an attempt to further reduce yearly budgets. It remains to be seen if future price reductions can be achieved and how these influence productivity.

Restrictions

There are some restrictions with the use of wider snow plows and other material substitutions that contractors would like to use. Some clients are restricting their use and not allowing innovations in a general sense. This could potentially stifle productivity and innovations. A partnering approach to innovations and which restrictions make sense might be more reasonable.

Discussion and Observations

Placing maintenance in open competition is the main productivity impact, but it needs to be done properly and opening the market to the private sector is a key challenge. In today’s world, there is typically a market available for maintenance services. However, this is a difficult decision made by the key decision makers and protecting the labor force is a difficult obstacle.

Some countries experienced more savings (some form of productivity gains) than others, which can be partially explained by the differences in the implementation practices (1). Countries that have been outsourcing for many years are beginning to experience a plateau or the savings decreasing with prices beginning to show some signs of increase. Since the costs were lower, there have been some forms of productivity increases. However, it is difficult to quantitatively measure the causes of productivity gains and they were not measured. Obviously, competition has resulted in productivity gains and using a performance-based approach. Some productivity increases were due to smaller staff resources needed to meet the desired quality standards. That means the limited resources have positively affected productivity. It also does matter how the implementation of PBMC is developed in each country and what practices were utilized.

A hybrid type PBMC model seems to be the most common. They are mainly performance-based measures while the remaining uses method-based requirements. The contract
duration can be five years or longer, bundling as many services as possible and by optimizing the contract area on a large scale.

Risks need to be described and allocated properly to improve transparency and cost considerations. Risks need to be balanced or equitable, or they may influence the contract prices. Perhaps a sliding scale risk scheme might be a logical consideration.

Finland is a unique country that includes a customer service bonus and lower salt usage incentive in the contract. These can be considered quite innovative as there are not many countries using incentives.

Many countries have the capability to measure the performance of the maintenance contractors through the performance measuring regimes provided in the MSS or asset management systems, but are not widely used. The asset management system or MSS is a tool to measure the response times, input asset conditions, and other miscellaneous information. Some functions are automated as the data is captured in real time and though automated systems, but much of the data is done by observations and human inspections. Asset management systems are important tools, which takes time, resources, and re-engineering. The benefits and return on investment often take time to be rewarded.

Encouraging innovation is an important consideration, but often lacks a rewarding system to produce the anticipated results. Contractors will typically use innovation to their advantage if it produces lower costs or better efficiency. Countries often lack the maintenance budgets and do not have additional funds to reward innovations. Rewarding innovation can be beneficial, but may not necessarily increase productivity, unless there are significant output gains.

Finding the most suitable PBMC usually takes time and experience in order to determine what works best in your own culture. Sometimes it requires a cultural change and savvy clients to know what works best for meeting the maintenance services. Reengineering the practices and continued benchmarking can provide a successful journey. Many countries are experiencing their second, third or even forth generations type PBMC and are pushing the envelopment in order to achieve Value for Money (VfM). Productivity in maintenance contracts is difficult to influence, but by providing the correct framework, may increase the chance of a successful outcome.

Other Findings

Most countries in this study have benefited from PBMC and have experienced other benefits when outsourcing to the private market. There may be some hidden knowledge or “tricks of the trade” that are not necessarily known, but come with experience and practice.

Other findings not specifically related to procurement or productivity measures were discovered and some are general aspects included in contracts while others are indirect and may not have any correlation with productivity. These other findings include:

- Most performance requirements are time and response
- Most performance measures are using a pass/fail systems with disincentives applied
- Many countries have now progressed to Lowest Price Conforming Tender (LPCT)
- General tendency to reduce contractor’s risks (byproduct is more bidders)
- Most countries use some form of price indices for inflation and price increases
- Most contracts include small improvements at a fixed cost
- A few countries are including periodic activities (balancing summer and winter workloads)
- Innovations were not as expected and are mainly ICT, GPS, management and equipment
- A few countries are using a sliding scale risk (compensation for salt usage due to
shortages)
  • Labor rates and market prices may affect productivity and costs
  • Cost certainty is lacking, unless unit prices are gathered (mainly known by the contractors)

*Time and Response Measures*
Most countries are using time and response in their performance measurement regime and typically use a “pass or fail” system. Some other countries not in the study are using a performance scorecard that measures the actual performance rating of a contractor in various asset groups. This requires more resources to measure the performance and provides more information on how good or bad the performance has actually been.

*Lowest Price Conforming Tender (LPCT)*
There is a trend toward the Lowest Price Conforming Tender (LPCT), which means that there is a certain threshold that must be achieved and then the lowest price offer wins the competition. The main reason for this approach is speculated to increase competition, not achieving expected quality benefits when using other parameters in the selection criteria, and reduces the contractors bidding costs.

*Risks*
Risks are a significant part of the PBMC and it is wise to know what causes risks to increase or decrease, as contractors will bid them in the contract. In order to achieve lower prices, there is a tendency to reduce the risks for the contractors. One clever idea is to develop a sliding scale risk for those difficult and challenging performance measures. A byproduct of lowering risks is that it also attracts more bidders and market entry.

*Using Price Index*
Since most contracts are about five years or longer, there is a cost or price index used in the contracts. Most contracts include some form of price indexing to take into account inflation or increased prices. These indexes vary from country to country as the cultures are different. The main intent is to use an index or system that represents true increases beyond the control of contractors. One example is fuel prices, which fluctuate from year to year.

*Additional Work*
Most maintenance contracts also include a provision for small improvements included in the PBMC. This means that some small projects can be added into the scope of the maintenance contract. Additional work is typically included as an upset price in the main PBMC, up to a certain monetary threshold. Also, road resurfacing is included in some PBMC and others have some periodic maintenance activities into the contract. These are usually in the form of unit or fixed prices.

*Inovation*
Most PBMC were expecting significant innovations. However, they have not been quite as expected. Most innovations have been in the form of equipment, GPS, ICT, and management. Also, the project management has seen improvements and the ability to manage resources effectively.
There have been recent harsh winters that have resulted in shortages of salt for de-icing materials in some countries. Prices were on the order of three to five times more expensive than normally. By including a sliding scale risk, it results in a more equitable sharing of risks and costs that may not have been envisioned. This goes hand-in-hand with having equitable risk sharing.

Market Prices

Since most PBMC are outsourced, it is important to follow the market prices and verify that Value for Money (VfM) is achieved. Most countries are having between three to six bidders on average, with the exception of Ontario in Canada, which is receiving more bidders compared to other countries. A functional market is vital to the success, and market prices should be studied on a systematic basis.

Cost Certainty

Most PBMC are lump sum or fixed price contracts. Some clients are under pressure to know the cost of individual services or activities and have certainty of costs. It is difficult to obtain cost certainty from each individual maintenance activity under preset conditions. Even though there are unit prices stipulated in the contract, the client may not be able to determine cost certainty of the actual services provided, and is mainly known by the contractors (trade secrets). This may or may not be a significant issue as costs per kilometer provides an overall indicator. It may be an issue if cost certainty of individual items or activities are desired, which may require further changes to the reporting requirements.

Lessons Learned Summary

When considering PBMC or improving existing maintenance contracting practices it is important to consider the lessons learned from other agencies and especially internationally. Many of these developments occurred globally and in progressive countries, extending to Australia, provinces of Canada and New Zealand.

It is wise to study the practices and challenges from others, because PBMC is not your traditional contracting method. A collection of lessons learned throughout history from maintenance contracting is presented subsequently. This is not an exhaustive list, but provides a broad perspective.

- Productivity is not measured in maintenance contracts
- Head-to-head competition is the main factor to increase productivity
- Sustaining a functional private sector market is very important
- Changing the internal culture and practices are difficult – PBMC is a different approach
- How the market is opened affects the success - it takes time to change the culture
- Using a performance-based approach, as much as possible
- Hybrid PBMC are perfectly acceptable
- Risks should be balanced and consider a sliding scale risk when appropriate
- Longer term contracts are better (greater than 5 years)
- Consider bundling of activities (economies of scope)
- Larger area contracts are better (economies of scale)
- Allow more flexibility and less restrictions to contractors
- Include small improvements at a fixed cost into the contracts
Many countries are now progressing to Lowest Price Conforming Tender (LPCT)

Measuring the performance of the service providers (cost and contract management)

Use factors that drive the correct behavior – disincentives and incentives (if possible)

Good project management is needed from both the client and contractor

Formal or informal partnering is essential

Most performance measures are pass/fail system with dis-incentives applied

Most performance measures are time & response

Contractor should collect the condition assessment data on a regular basis

Have interactive and interoperable MMS and ICT system as they have great potential for focusing resources and tracking performance (relates to pro-active asset management)

Using modern, interchangeable and intelligent equipment

Cost certainty at the micro-level is being lost in PBMC

New innovations are desired, but clients at times, have difficulty accepting

Standardization broadly applied (in contracts and practices)

Cooperation with the private market via forums, meetings & other cooperative efforts

Requires good leadership in client organization

Simultaneously using several models for differing circumstances (rural versus urban)

Consider alternative payment schemes to match pro-active asset management practices

Consider contractor past performance rating system or approved contractor listing

Possibly considering some corridor based contracts (this needs to be tested by ViM)

Not maximizing the usage of labor and equipment

Lacking skilled workforce (continued pressure on contracts may not improve skills)

Stipulation of in-house work performed by main contractor (e.g. ~25% minimum)

In summary, measuring productivity of the maintenance contractors may be futile, but determining the factors that potentially influence productivity can be of great value to those countries using PBMC or those considering outsourcing of maintenance activities. Also, learning from one another by sharing lessons learned and better practices may improve the PBMC and provide better value for money. The full final report from this study is available from: http://www.sou.gov.se/prodkom/rapporter.htm.

CONCLUSIONS

Public clients in this study are not measuring the productivity of the maintenance contractors. Measuring the actual productivity of maintenance contracts is extremely difficult, if not virtually impossible under existing practices.

The main productivity gains are achieved by placing the maintenance services into open competition, which may be a highly contentious and controversial issue in some countries. All countries in this study are using a Performance Based Maintenance Contracting (PBMC) approach. PBMC approach deviates significantly versus outsourcing using traditional methods and practices. Other factors potentially contributing to productivity are; using longer term contracts (as much as possible), using larger areas (economy of scale), bundling of services (economy of scope), a balanced approach to risks, having innovative and modern intelligent equipment, using incentives and disincentives, allowing more freedom and flexibility of the contractors, using partnering, measuring the performance of the maintenance contractors, applying an ICT system that is flexible and easy to use, and using the hybrid type model.
What works for other countries may not necessarily work as well in your country, as the cultural differences may have a significant impact. Having a well-organized and efficient maintenance regime certainly influences productivity, but is mainly dependent upon the contractor’s processes and practices. This requires a learning process and may not be achieved by the novice clients and those having a traditional approach to asset maintenance. In essence, creating an environment of opportunities and framework for success can have a positive influence on the productivity.

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