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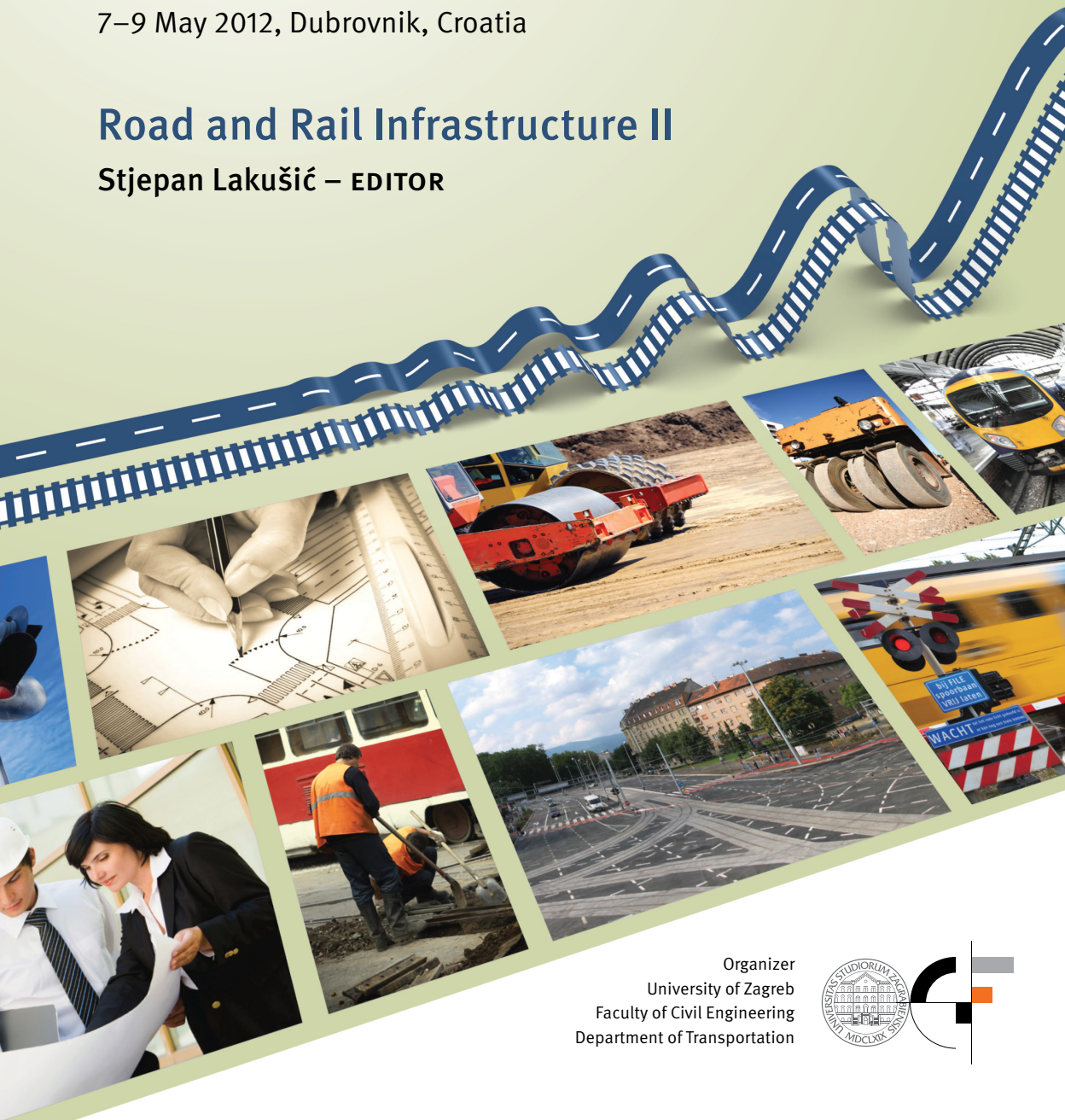
Road and Rail Infrastructure II

Stjepan Lakušić – EDITOR



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WORLD–CLASS PERFORMANCE BASED MAINTENANCE CONTRACTS – RECENT TRENDS

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Abstract

Performance Based Maintenance Contracting (PBMC) for roads has been used for many years in response to the pressure for the road agencies/administrations to improve efficiency and provide better maintenance services. This pressure from the decision–makers has resulted in further advancements, which in turn require rethinking PBMC. Several countries are outsourcing the maintenance services and it is vital to have a healthy market of service providers. The paper will discuss the findings from two recent research projects, which studied several progressive countries and progress internationally in the provision of maintenance services. The objective of the paper is to present the recent international trends in PBMC. It benchmarks and monitors international practices and presents results, challenges, practices and benefits from using PBMC world–wide. The paper concludes that for full benefits and satisfactory outcomes of PBMC it is important to maintain a functional service provider market.

Keywords: Performance Based Maintenance Contracts (PBMC), outsourcing, maintenance, trends, maintenance contracting

1 Introduction

Several countries around the world are beginning to outsource the routine maintenance services for the road network in one inclusive contract. The reasons include the reduction in public administrations, cost savings, and the advantages of private sector innovations and practices. Road administrations or agencies (herein referred to as road administration), desire to increase productivity, improve efficiency and utilize better or innovative practices. However, many countries still continue to provide services by their own workforce or direct labor force. Sometimes they do outsource some services, but only through selected activities.

Most road administrations that outsource routine maintenance in one inclusive contract are using a performance–based approach, which is often termed as Performance Based Maintenance Contract (PBMC). A PBMC is defined as an entity (usually a private service contractor – herein referred as the Contractor) that is responsible for maintaining and managing the road assets to a predefined set of conditions or services levels. The intention in a PBMC was to allow the private sector involvement and to develop and use practices that encourage innovations and new product developments. As road administrations were being downsized, PBMC was considered as a possible solution.

The principal differences between the traditional and performance based contracts are that in the latter more risks are shifted to the service provider, there is a potential for cost savings, less administration, more reliance on asset management, and the possibility for innovations.

It is very important that the road administrations define appropriate service levels for performance requirements in the contract because the performance measures are the heartbeat of a

PBMC. The contractor is responsible for managing and maintaining the assets to the specified service levels and establishes a strategy and a plan to meet these service levels. The contractor is also responsible for management, operations, administration of the services. This means the contractor should have well–developed administration, accounting, staffing and planning systems, and systems for quality control, modern project management capability, and prefereably also for maintenance management (or utilize those supplied by the road administration).
This paper highlights the results obtained from two recent international projects that were completed for the Swedish Road Administration (now known as Swedish Transport Administration) and for Sweden Productivity Committee. The first was an international study of winter road services, pavements, rest areas in cold climate regions, which included R&D and environmental considerations. The study was titled 'The Road to Excellence' [1]. The second international study was to determine which type of maintenance contract can best influence the productivity of contractors and was titled 'Improving Productivity Using Procurement Methods – an international comparison' [2]. The first study involved both authors of this paper and the second study was completed by the corresponding author. The results of these studies, the author's experiences in the two studies and elsewhere, and other pertinent details will be reflected throughout the paper.
It is wise to study international trends and developments so that modern and innovative practices can be incorporated or adapted into the existing maintenance programs.

2 Methodology and objective

There have been many studies and reports regarding Performance Based Maintenance Contracts (PBMC). This paper will include resources through published reports, technical papers, contacts with road administrations and from the results of the two recent studies mentioned earlier. The intent of this paper is to highlight the most recent practices, determine recent trends, results, challenges, and practices used in some of the most progressive countries. In addition, a listing of the lessons learned will be presented for the purpose of disseminating practices that may be helpful for those considering the implementation of PBMC for the road sector.

3 PBMC practices

A PBMC is significantly different of the traditional maintenance contract. It requires a different approach and more 'hands off' attitude on the part of the road administration and competence for monitoring quality through spot checking and verification. Also, the tendering practices differ mainly due to the cultural differences, but PBMC can be arranged in many ways.

3.1 Contract requirements

In PBMC, the contractor is responsible for managing, maintaining the assets to a satisfactory condition, and administering the various duties.This means that the contractor should have well–developed technical systems identified earlier. During the procurement process the contractor is usually required to submit the following requirements in the bid:
· Work plan
· Quality Control plan
· Annual work plan
· Staffing & management plan
· Traffic management plans
· Maintenance management system
· Management of customer complaints
· Emergency contacts and procedures, and
· Cost proposal

This requires the contractor to be savvy in order to win proposals and often the smaller or traditional contractors do not have the capability or experience to manage a PBMC.

3.2 Routine and periodic maintenance

Contracts can be integrated, comprehensive, or combinations of various types of activities. The common terminology used is routine and periodic maintenance. Not all activities can be included in a PBMC. In the Nordic countries the periodic maintenance is usually separate because the winters are cold and long and it is more cost effective to separate contracts for the two periods. Routine and periodic maintenance are discussed below and the nice part of PBMC is that any activity may be included, provided there are efficiency gains.

3.2.1 Routine maintenance

Routine maintenance can be defined as those maintenance activities that occur every year on a routine basis or are of a cyclic nature. These activities include winter maintenance, summer maintenance, pot hole patching, vegetation control, cleaning (signs, bridges, roads), and numerous other activities.

3.2.2 Periodic maintenance

Periodic maintenance can be defined as those activities that occur infrequently and are often referred to as 'upkeep and improvements'. Throughout the history most periodic maintenance tasks have been tendered as separate contracts, but they may be included into one single comprehensive maintenance contract. These activities include road resurfacing, bridge rehabilitation or reconstruction, safety improvements, environmental mitigation and other minor improvements.

3.3 Contract duration

The contract duration is probably the most important decision that road administrations will determine in their contracts. In the beginning of the outsourcing, most countries started with three year contracts to make sure that there will be a sustained market for the road maintenance. After moderate experience, contract durations were increased to 5 years with possible annual options. Today the duration of most PBMC are in the range of 5–7 years as the increased duration tends to increase economies of scale. A distinct few, Canada for example, have progressed to over 10 year contracts. The most advanced contracts include some forms of partnering and informal dispute resolution mechanisms, where challenges and conflicts can be resolved in an amicable manner. This is beacuse most contracts are incomplete and cannot possibly include all situations in a written document. Therefore, it is important to have trust, communications, and a procedure that will allow for resoving unanticipated events or conflicts.

3.4 Performance–based approach

A performance–based approach is the main ingredient of a PBMC. It is expected to provide flexibility and boost innovation from the contractors. The challenge in developing the performance measures is the need for robust data and finding the best measures, which are normally based upon existing practices. An iterative process is recommended and may require re–engineering the measures to ensure their appropriateness. PBMC is the common maintenance practice used in the countries discussed in this paper.
There was a noticeable variation in the implementation and amount of performance–based requirements. The hybrid model (combination of performance and method–based measures) was the most common approach. It is difficult to have all measures defined in terms of outcome criteria.

4 Discussion and results from PBMC

PBMC have typically resulted in satisfactory results and many countries have received savings [3] compared to the traditional practices. Any change in contracting is not without challenges, but the overall results have been mostly satisfactory and desired objectives have been achieved. Some countries have achieved savings while others have demonstrated that the private market can be functional for routine maintenance. Downsizing of the road administrations has not reduced the service levels, but in fact promoted the acceptance of PBMC. Overall the PBMC model has been tested and has produced satisfactory results.

4.1 Trends

The common characteristic and trends from the recent and previous studies on PBMC can be summarized in the following:
· Using a Hybrid model – conbination of performance & method requirements
· Longer contract duration (economies of scale)
· Larger contract areas (economies of scale)
· Bundling activities (economies of scope)
· Lowest Price Conforming Tender (LPCT)
· More service and cost risks for contractors
· Contractor collection of the asset data

4.2 Other practices in PBMC

There are many other issues in PBMC that are important. This is especially true for those countries that have totally divested of own work forces and reliant on private sector care for road maintenance. These factors are as as follows:
· Healthy and functional market
· Availability and use of an acceptable price index
· Response time related perfromance measures
· Penalties for non–performance
· Focus on asset management
· Partnering

4.3 Challenges in PBMC

PBMC presents several challenges and obstacles for those that are in the beginning phases and for those that are contemplating the use of PBMC. Probably the biggest challenge is the decision to open the market for PBMC as there may not be a contracting profession available. Others challenges include:
· Creation of a deliberate process
· Conflicts in attitudes between the new and 'traditional' road management culture
· Development of appropriate performance measures or levels of service
· Uncertainties in the costs of meeting desired performance standard
· Distribution of risks between the contractor and the client
· Loss of control of the working means and methods
· Legal restrictions (some countries require the acceptance of low–bid with no points for quality and competence)
· Start–up costs for new contractors
· Political priorities that cannot be managed easily
· How to announce and communicate the new procurement strategy to the road administratiion staff and the industry

· Development of good contract documents
In any event the introduction of PBMC will take time and use resources.

5 Lessons learned

A long list of lessons learned [4] has been gathered from collecting and digesting lessons of experience over the past ten years. The list below is not exhaustive, but provides a broad perspective of lessons learned in PBMC. The summary is recorded below:

· Competition is the main factor to increase efficiency and potential savings
· Sustaining a healthy & functional private sector market is very important
· Changing the internal culture and practices in road administrations are difficult – PBMC is a different approach
· How to open the market for services is important – it also takes time to change the contractor culture
· Performance–based approach is preferable for as many activities as possible
· Hybrid PBMC are perfectly acceptable
· Risk allocation with a sliding scale risk (contractor bares the risk to a certain level, while the road admininstration bares the remaining)
· Long term contracts are better (greater than 5 years) than short term contracts
· Bundling of activities (economies of scope) is a good practice (such as including resurfacing at a fixed price)
· Larger area contracts are better (economies of scale)
· More flexibility and less restrictions is advantageous, this may include small capital improvements at a fixed cost
· Many countries have now progressed to and prefer Lowest Price Conforming Tender (LPCT)
· 'Wisdom' in measuring performance of the service providers
· Use of incentives to drive 'correct' behavior – incentives are better than disincentives (if possible)
· Mobilization of new contractors may cause early challenges (need time)
· Importance of transparent and fair tendering practices
· Good project management is needed from both the client and contractor
· Good communications between the contractor and the client is of paramount importance
· Cooperation with the private market via forums, meetings & other cooperative efforts
· Formal or informal partnering is important
· Many performance measures are with pass/fail criteria with disincentives
· Most performance measures are defined by time & response
· Contractor should collect the condition assessment data on a regular basis (eyes and ears of the client)
· Develop an interactive and interoperable Maintenance Management Systems (MMS) and ICT system as they focus on resources and performance tracking, which relates to pro–active asset management)
· Use of modern, interchangeable and intelligent equipment
· Cost information at the micro–level is being lost in PBMC
· New innovations are desired, but clients at times have difficulty accepting them
· Standardization is broadly applied (in contracts and practices)
· PBMC requires good leadership in client organization
· Several models of PBMC are in use for different market circumstances (rural versus urban)
· Consider payment schemes with incentives to match pro–active asset management practices
· Develop and use contractor past performance rating system or approved contractor classification
· Corridor based contracts may be appropriate in some markets or circumstances
· Restricting subcontracting by the main contractor (e.g. ~70% maximum)
· Learn from other countries practices rather than starting from the beginning

6 Conclusions

PBMC involves a cultural change from the normal way of doing road maintenance. It focuses on what to achieve (the outcomes) instead of methods how to achieve it. Each country that has adopted PBMC has also tailored the PBMC concept to their local context. Perhaps, the success of PBMC is in that each culture can apply the principle of PBMC and deliver the concept in multifaceted ways and means. Countries also evolve the PMBCs as they gain experience; a few are in their third, fourth or even fifth generation of PMBC contract development.
The trend seems to favor:
· long–term contract duration,
· a hybrid type PBMC contract model with both routine and possibly
· periodic maintenance activities,
· performance measures for area–wide networks,
· bundling of activities, using a Lowest Price Conforming Tender, and
· fair allocation of risks.

What works well in one country may find cultural difficulties in another country and does not necessarily achieve the same benefits. It is wise to implement those features that produce the gains in their domestic application of PBMC.
Having a well–organized and efficient maintenance regime certainly improves the success and the main task of the road administrations is to establish a framework for success by using maintenance contracts that provide opportunities for efficiency and productivity. This requires a learning process and re–engineering of practices to achieve desired results. The biggest challenge is to create a healthy and competitive market for the maintenance services so that innovation, efficiency and productivity can be realized.

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