INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

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SPECIAL ISSUE FOR
NATIONAL LEVEL CONFERENCE
"Recent Trends and Development in Civil Engineering"

DEVELOPMENT OF OUTPUT AND PERFORMANCE BASED ROAD CONTRACT (OPRC) MODEL FOR MAINTAINANCE AND MANAGEMENT OF ROADS

JAYKUMAR SONI[1], RAJESH GUJAR[2], TEJASKUMAR THAKER[2], SAGAR DESHMUKH[3], MAHESH H. M.[3]

1. M. Tech Student (Infrastructure Engineering and Management), Dept. Of Civil Engg, PDPU, Gandhinagar
2. Assistant Professor, Department Of Civil Engineering, Pandit Deendayal Petroleum University, Gandhinagar
3. Associate Director, Lea Associates South Asia Pvt. Ltd, Gandhinagar

Accepted Date: 27/01/2018; Published Date: 01/03/2018

Abstract: Road infrastructure is considered as the lifeline of the economy of a country and Its importance in the development of a country cannot be ignored. Creating assets is one aspect and it is one time; but maintaining them is a real challenge for the government. Improperly maintained roads lead to significant raise in vehicle operating costs, increase accident rates and aggravate isolation, poverty, poor health, and illiteracy in rural communities. Reduction in maintenance cost and provision of timely improvement of road transportation is the need for preservation of road infrastructure. Traditional methods of maintaining roads over the years are not giving the required service levels and; In addition, most of the methods are lacking in providing benefits for stakeholders including employer, concessionaire and road user. There is a need of changing the focus towards maintainance and management of Road Network and Output and Performance Based Road Contracts (OPRC) is one of the new methods for the maintainance and management of existing as well as new roads which provides efficient, cost-effective and innovative maintainance service and help maintain roads as assets.

Keywords: Output Based Contracts, Road Maintainance, Road Management, Service Level, Performance Based Management

Corresponding Author: JAYKUMAR SONI

Access Online On:

www.ijpret.com

How to Cite This Article:

Jaykumar Soni, IJPRET, 2018; Volume 6 (7): 71-76

PAPER-QR CODE

INTRODUCTION

Importance of Road Maintenance:

The need of maintenance is widely recognized, it is still not getting adequately done.Many countries spend very less of what they should be spending on maintenance of roads. And this phenomenon is widely depicted in developing countries who are focusing on developing new infrastructure rather than maintaining the existing ones.(Burningham and Stankevich, 2005)

Despite the importance of roads, many countries are spending less than 50% of required amounts for the maintenance and management of road network. Here, the poor road condition leads to the higher cost of road user and ultimately the user has to spend high amount as a part of rehabilitation cost of existing roads in form of various taxes and tolls (Rohatgi, Specialist and Bank, 2011)

Types of Road Maintenance:

Maintenance comprises of activities to keep pavement, shoulders, slopes, Drainage facilities and other structures within road margin to renewed condition. These maintenances are of three types:

- Routine
- Periodic
- Emergency or Urgent(Burningham and Stankevich, 2005)

Routine Maintenance:

Which comprises small-scale works conducted regularly, aims “to ensure the daily pass ability and safety of existing roads in the short-run and to prevent premature deterioration of the roads” (Radović *et al.*, 2008).

Periodic Maintenance:

Which covers activities on a section of road at regular and relatively long intervals, aims “to preserve the structural integrity of the road” (WB Maintenance website). Activities can be classified as preventive, resurfacing, overlay, and pavement reconstruction. Resealing and overlay works are generally undertaken in response to measured deterioration in road conditions(Burningham and Stankevich, 2005).

Urgent maintenance:

It is undertaken for repairs that cannot be foreseen but require immediate attention, such as collapsed culverts or landslides that block a road. Maintenance does not include rehabilitation, building shoulders, or widening roads. (Stankevich, Qureshi and Queiroz, 2005)

Concept of Output and Performance based Road Contracts:

‘Output and Performance based Road Contracts: OPRC’ for roads significantly differs from method based contracts that have been used to maintain roads (Radović *et al.*, 2008)**.** The basic difference is that under OPRC, most of the payment to be made to the contractor are based on measured “Outputs” reflecting the target condition of the roads under contracts expressed

through service levels. Another major difference is that the contractor is fully responsible for the design of works which are necessary to reach to the required levels (Radović *et al.*, 2008)
OPRC is also suitable for **Long Term DBOM (Design-Build- Operate-Maintain)** which is having its main focus towards **Maintainance and Management**(Radovic et al., 2014)**.**This Contract is an agreement between Government Department and Private Contractor whereby the private contractor maintains the road to achieve Specified Condition Standards for a certain period of time in return for a fixed payment scheme (Mulmi, 2016).

One of the main objectives of OPRC is that it helps to ensure that variation orders are minimised and that the contractor is generally paid in equal instalments throughput the contract period (Radović *et al.*, 2008). It is a new way of Road Works Contracting and a contract modality for Road Asset Management and Maintainance. (Rao, 2012)

Difference of Approach between Traditional Methods and OPRC:
In traditional method-based contracts, the road agencyas a client normally specifies techniques, technologies,materials and quantities of materials to be used, togetherwith the time period during which the maintenance worksshould be executed. The payment to the contractor isbased on the amount of inputs (e.g., cubic meters ofasphalt concrete, number of working hours)(Stankevich, Qureshi and Queiroz, 2005). Whereas, in performance-based contracting the client does notspecify any method or material requirements. Instead hespecifies performance indicators that the contractor isrequired to meet when delivering maintenance services. According to the World Bank Procurement Guidelines(2004), performance-based procurement, also calledoutput-based procurement, refers to competitive procure(Stankevich, Qureshi and Queiroz, 2005)

For example, the contractor is not paid for the number ofpotholes he has patched, but for the output of his work:no pothole remaining open (or 100% patched). Failure tocomply with the performance indicators or to promptlyrectify revealed deficiencies adversely affects thecontractor's payment through a series of clearly definedpenalties. In case of compliance the payment is regularlymade, usually in equal monthly instalments (Stankevich, Qureshi and Queiroz, 2005).

Table 1.1 Difference between Traditional and OPRC Approach

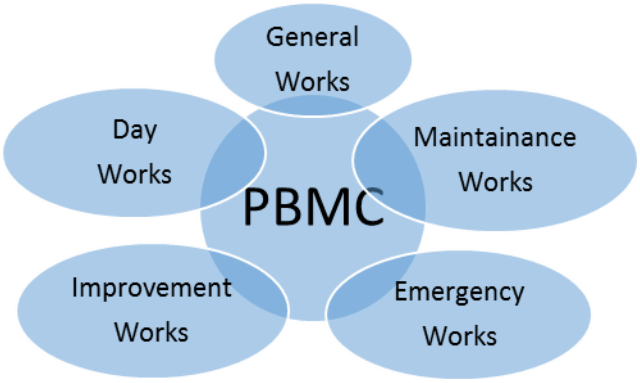
Traditional Approach	OPRC Approach
Road by Road (Fixing Bad Roads)	Road Sector Efficiency (Network Management Methodology)
Project Landing	Sector Programme Financing
Road Engineering View	Road User View (Service Level)
Completion of Work… Payment…End	Provision of Service Level over Long Periods
Payment based on Unit Price	Payment based on Reflected Output

Source: (Rohatgi, Specialist and Bank, 2011)

Under the OPRC, the contractor has a strong financial incentive to be efficient and effective whenever he undertakes the work (Radović *et al.*, 2008). In order to maximise profits, he must reduce his activities to the smallest possible volumes of intelligently designed interventions which never the less ensure that predefined indicators and service level criteria are achieved and maintained over time and he is free to define what to do, when to do, how to do, where to do.(Radović*et al.*, 2008)

Importance of Service Level Criteria:

Figure 1.1 Works Related to PBMC Contracts



Here; 'Service level' define the desired road performance standards mainly from road users' perspective. They are the operational conditions of roads. Whereas, 'Performance Criteria' should cover all aspects of contract (Rao, 2012). Service level criteria should be defined on the basis of affordability and economically justifications (Rao, 2012). The performance indicators must ideally cover all aspects of contracts, they should be clearly defined and measurable (Radović *et al.*, 2008)

Figure 1.2 Service Level Criteria

The contractor has to ensure that road user get a service level at certain level.

Implementation of OPRC Contracts Worldwide:

Road agencies adopted OPRC approach have achieved cost saving from 10% to 40% compared to traditional method based contracts.(Radović *et al.*, 2008)

Following are the various countries where Output and Performance Based Contracts have implemented successfully:

Table 1.2 Worldwide Cost Saving in OPRC

Sr. No.	Country	Cost Saving (in %)
1	Norway	20-40
2	Sweden	+/- 30
3	Finland	30-35
4	Holland	30-40
5	Britain	10 (Min)
6	Australia	10-40
7	New Zealand	20-30
8	USA	10-15
9	Ontario Cda	+/- 10
10	Alberta	+/- 20
11	Canada	+/- 10

Though having same concept; Output and Performance Based Road Contracts (OPRC) has various names where it has been implemented like; “Performance Contracts” in Western Australia, “Asset Management Contracts” in USA, “Performance Specified Maintenance Contracts” in Australia and New Zealand, “Contracts for Rehabilitation” in Argentina and Brazil, “Managing Agents Contracts” in United Kingdom (Final, no date)

Reasons to go for Output and Performance based Road Contracts (OPRC):

Road agencies have moved towards this approachbecause it offers several advantages over moretraditional approaches: (a) cost savings in managing andmaintaining road assets; (b) greater expenditurecertainty for road agencies; (c) ability to manage theroad network with fewer agency staff; (d) bettercustomer satisfaction with road service and conditions;and (e) stable multi-year financing of maintenance. Apart from all these; following are more benefits obtained from implementation of OPRC:

- The performance based contracts can lead to cost savings through:
- Incentives to the private sector for innovation and higher productivity;
- Reduction in administrative expenses and road agency overheads, due to better packaging of contracts, requiring fewer agency personnel to administer and supervise contracts;
- Significantly greater flexibility in the private sector (than in the public sector) to reward performance and react quickly against non-performers(Stankevich, Qureshi and Queiroz, 2005; Learned, Forward and Siddique, 2017)

CONCLUSION:

It can be seen that creating assets is one aspect and it is one time; but maintaining them is a real challenge for the government. Traditional methods are having certain lacunas which leads to Improper maintainance and management of roads. Output and Performance Based Road Contracts (OPRC) have certain benefits like Reduction in Maintenance Cost, Providing Transparency to Users, Improving Quality and Control Standards and Improving Overall Road Conditions. Therefore, by implementing Output and Performance Based Road Contracts (OPRC) for the maintainance of roads can provide cost-effective, innovative and efficient maintainance service and the value for money can be achieved significantly.

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