

Performance-Based Contracts for Management and Maintenance of Roads (PMMR)

**Module 6
Sample Bidding Document
of the World Bank, Washington, D.C**

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Introduction (1)

- **This Sample Bidding Document for Performance-Based Management and Maintenance of Roads (PMMR) is a response to a growing demand worldwide for this type of service.**
- **It is structured to fit the specific nature of the PMMR and differs substantially from traditional contracts for civil works.**
- **The basic difference is that a PMMR contract is an “output” based contract instead of an “input” based type as used traditionally for civil works.**
- **Most of the payments to be made to the contractor are not based on quantities of works measured by unit prices for works inputs, but on measured “outputs” reflecting the “Service Levels” of the roads under contract.**

Introduction (2)

- The main focus of the contract is on Maintenance Services to be provided by the contractor, including physical works on the Roads under contract which are needed to maintain the agreed Service Levels, but also all activities related to the management and evaluation of the road network under contract.
- The contract also allows for the execution of
 - Rehabilitation Works
 - Improvement Works
 - Emergency Works

Specifications (1)

Part A: Performance Specifications

- **Include a detailed description of**
 - **the concepts on which the PMMR is based;**
 - **the Service Levels required on the roads;**
 - **the methods and procedures to be applied for measuring compliance with Service Levels;**
 - **the payment reductions or liquidated damages applied in case of non-compliance,**
 - **the Rehabilitation Works and the Improvement Works the contractor will have to carry out in addition to the Services of Management and Maintenance, and**
 - **other aspects, such as the internal organization of the contractor, etc.**

Specifications (2)

Part B: General Specifications for Roadworks

- This part is very country-specific and should present the norms and specifications generally applied for roadworks in a specific country, mainly in terms of quality and workmanship.

Specifications (3)

Part C: Specifications for Emergency Works

- Describe the procedures and other rules to be applied if Emergency Works are to be carried out within the contract. Use of the sample text would help to ensure that the concept of Emergency Works is not misused.

Part D: Environmental and Social Specifications

- Provide a set of rules to be followed by the contractor in order to avoid unnecessary damage to the environment and to cover social aspects on housing, sanitation and health of labor.

Specifications (4)

- **Other Specifications may be needed concerning the use of materials, plant and equipment by the contractor, if the provisions included in the General Conditions of Contract (GCC, Section IV) and complemented in the Special Conditions of Contract (SCC, Section V) are deemed insufficient by the Employer.**
- **Only if the various parts of the Specifications are completed adequately and included in the bidding document, will the objectives of economy, efficiency, and equality in procurement be realized, responsiveness of bids be ensured, and the subsequent task of bid evaluation facilitated.**

Performance Criteria (1)

- The performance criteria should ideally cover all aspects of the contract and take account of the fact that different sub-areas within the contract area might require different Service Levels. Criteria can be defined at three levels (although simpler contracts will not use all of the criteria identified below):

Performance Criteria (2)

- (a) Road User Service and Comfort measures, which can be expressed in terms such as:
 - Road Roughness
 - Rutting
 - Skid resistance
 - Vegetation control
 - Availability of each lane-km for use by traffic
 - Response times to rectify defects that compromise safety of road users
 - Attendance at road accidents
 - Drainage off the pavement

Performance Criteria (3)

- **(b) Road Durability measures, which can be expressed in terms such as:**
 - Longitudinal profile
 - Pavement strength
 - The extent of repairs permissible before a more extensive periodic maintenance treatment is required
 - Degree of sedimentation (obstruction) in drainage facilities

Performance Criteria (4)

- **(c) Management Performance Measures, which define the information the Employer requires both to govern the asset during the term of the contract, and to facilitate the next tender round. Requirements include:**
 - **Delivery of regular progress reports to the Road Controlling Authority**
 - **Inventory updates and other data sharing requirements**
 - **Maintenance history (so subsequent tenderers can price work)**

Performance Criteria (5)

To avoid ambiguity, all performance measures must be defined and objectively measurable.

Performance Criteria (6)

- Define the minimum acceptable Service Levels for a particular road, the following aspects need to be carefully considered, such as
 - traffic volume and composition,
 - urban vs. rural roads
 - flat, hilly or mountainous terrain,
 - subgrade quality and type,
 - quality of available construction materials,
 - capacity of available contractors,
 - any environmental constraints, such as protected areas, parks, forest reserves, etc.
- However, probably the most important criterion is the question of **what Service Level can be afforded and economically justified for the road in question.**

**Annex to
SAMPLE BIDDING DOCUMENT**

**Procurement of
Performance-Based
Management and Maintenance
of Roads**

**SAMPLE SPECIFICATIONS
for PMMR contracts**



**The World Bank
Washington, D.C.**

June 2005

Typical Service Levels for Unpaved Roads

	Fair	Good	Very Good
Typical Traffic Volumes (Vehicles/day)	Less than 50	50 - 150	150 - plus
Average Traffic Speed (kph)	40	60	70
Surface Degradation – Maximum diameter of any single degradation	45cm	35cm	25cm
Surface Degradation – Max Number greater than nominated diameter in any 100m	20/30cm	10/25 cm	2/25cm
Cleanliness of pavement surface and shoulders response time for safety related matters	24 hrs	8 hrs	4 hours
Cleanliness of pavement surface and shoulders response time for all other matters	14 days	7 days	3 days
Road Corrugation Amplitude	4.5cm	3.5cm	2.5cm
Rut Depth	10 cm	7 cm	5 cm

Typical Service Levels for Paved Roads (1)

	Fair	Good	Very Good	Excellent
Typical Traffic Volumes (Vehicles/day)	Less than 250	250 – 1000	1000 - 5000	5000 - plus
Potholes (Max Dia of any single pothole)	400mm	300mm	200mm	None allowed
Potholes(max number in any 1000m with diameter greater than 100 mm)	10	5	1	None allowed
Patching (Response time)	28 days	28 days	14 days	7 days
Cracking (Response time)	28 days	28 days	28 days	28 days
Cleanliness of pavement surface and shoulders response time for safety related matters	8 hrs	4 hrs	2 hrs	1 hr
Cleanliness of pavement surface and shoulders response time for all other matters	14 days	7 days	5 days	3 days

Typical Service Levels for Paved Roads (2)

	Fair	Good	Very Good	Excellent
Typical Traffic Volumes (Vehicles/day)	Less than 250	250 – 1000	1000 - 5000	5000 - plus
Rutting	4 cm	4 cm	3 cm	2 cm
Rutting (Response time)	56 days	56 days	28 days	28 days
Patching (Response time)	28 days	28 days	14 days	7 days
Raveling (Response time)	28 days	28 days	14 days	7 days
Loose Pavement edges (Response time)	28 days	28 days	14 days	7 days
Height of Shoulders vs. Height of pavement	7.5 cm	5.0 cm	5.0 cm	5.0 cm
Height of Shoulders vs. Height of pavement (Response time)	56 days	56 days	28 days	14 days
Paved shoulders (Response time)	56 days	56 days	28 days	28 days

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- Part A1. Basic concepts of Performance-Based Contracts Management and Maintenance of Roads
- Part A2. Description of Services to Be Provided
- 2.1 General Specifications (for unpaved and paved roads)
 - 2.1.1 *Scope of Services to Be Provided*
 - 2.1.2 *Description of the project area*
 - 2.1.3 *Description of the Roads Included in Contract*
 - 2.1.4 *Reference Information*
 - 2.1.5 *Design Criteria for Rehabilitation and Improvement Works*
 - 2.1.6 *Rehabilitation Works to Be Carried out by Contractor*
 - 2.1.7 *Improvement Works to Be Carried out by Contractor*
 - 2.1.8 *Quality of Materials to be used*
 - 2.1.9 *Self-Control Unit of Contractor*
 - 2.1.10 *Communications Equipment*
 - 2.1.11 *Site Regulations and Work Procedures*
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- 2.1.1 *Longitudinal Profile (applicable for unpaved roads only)*
- 2.1.2 *Monthly Statement*
- 2.1.3 *Program of Performance*
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- 2.1.3.2 *Health and Safety Management Plans*
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 - 2.3.1 Road User Service and Comfort Measures for unpaved roads (*Usability of the Road, Average Traffic Speed, Road User Comfort*)
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 - 2.4.2.1 Road Roughness*
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 - 2.4.3 Variations and gradual compliance with Service Levels*
 - 2.4.4 Means used for Assessing of Service Levels for Paved Roads*
 - 2.4.5 Methodologies and Procedures to be Used for Measurement of Service Levels on Paved Roads*

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➤ 2.5 Signaling and Road Safety

2.5.1 Service Level Measures for Signaling and Road Safety

2.6 Drainage

2.6.1 Service Levels

2.6.2 Variations and Gradual Compliance with Service Levels

2.6.3 Procedures for Inspection

2.7 Vegetation

2.7.1 Service Levels

2.7.2 Variations and Gradual Compliance with Service Levels

2.7.3 Means used for Assessing Compliance with Service Levels

2.8 Structures

2.8.1 Service Levels

2.8.2 Variations and Gradual Compliance with Service Levels

2.8.3 Procedures for Inspection

2.9 Slopes – Cuts and Embankments

2.10. Payment Reductions and Liquidated Damages

Payment Reductions for Non-compliance with Service Levels (Sample for Paved Roads)

Criteria	Conditions for Application of Payment Reductions	Unit Rates per Calendar Day of Non-Compliance
Road Usability	Interruption of motorized traffic (light and/or heavy vehicles) anywhere along a new road or road section.	20% of monthly lump sum for the entire road and all other affected roads included in the contract for each day of non-compliance
Average Traffic Speed	Average traffic speed on road or road section is below the required threshold value.	10% of monthly lump sum, applied to the entire road for each step of 5 km/h below the threshold
Road User Comfort	- <i>Corrugation amplitude (maximum)</i> : The maximum amplitude measured anywhere in a one km section is above the threshold value.	50% of the monthly lump sum for the length of road which does not comply
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Compliance Evaluation for Monthly Payments

Sample Specifications for PMMR contracts

12

Monthly Statement for Contract

Road or road section:

Required Service Level

Length of road at required service level (km)

Contract Name

Road A and Road B

Very Good

34.8

Contract Month: 12 (September 2005)

Service Level Criteria	Required compliance		Actual compliance				Non-compliance		Payment Reduction
	Target	Km ₁	Compliance criteria	Road A	Road B	Total length compliant (km) ²	Length non-compliant (3) (1-2)	% Payment reduction (4)	Km (5 = 3x4)
1. Road Usability	100%	34.8	Interruption to traffic (km days)	100%	100%	34.8	0	1% Sub total	0 0
2 Average Traffic Speed	60 kph		Average speed (per 5 kph below target)	60 kph	60 kph	34.8	0	1% Sub total	0 0
3. Road User Comfort	43%	15.0	Corrugation amplitude	12	14	26	0.00	50%	0
			Rut depth	8	6	14	0.96	50%	0.48
			Individual degradations	18	16.8	24.8	0.00	50%	0
			Total area of degradations	18	16.8	34.8	0.00	10%	0
			Road signs	25%	30%	9.5	5.46	25%	1.37
			Sub-total					1.85	
4. Durability	38%	13.2	Vegetation height	18	16.8	34.8	0.00	25%	0
			Vegetation clearance	18	16.8	34.8	0.00	25%	0
			Useable road width	6	3	9	4.22	10%	0.42
			Longitudinal profile	Not evaluated	this month	34.8	0.00	10%	0
			Drainage	12	7	19	0.00	50%	0
			Sub total					0.42	
			TOTAL					2.27	

Length in km for payment at this service level this month: 32.53

Payment Summary – Contact PMMR/1

Contract month: 12

Service Level	Network km	Penalty km	Km for payment this month
VERY GOOD	34.8	2.27	32.53
GOOD	87.1	5.62	81.48
FAIR	99.6	7.30	92.3
TOTAL	221.5	16.19	206.31
Total payment due this month	Rate per km x km for payment		

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