

# SUSTAINABLE FINANCING FOR THE MAINTENANCE OF PAKISTAN'S HIGHWAYS

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## ABSTRACT

*Under-financing and over-reliance on road transportation in Pakistan have led to the rapid and premature deterioration of its road assets, which are valued at over US\$ 41.6 billion. In order to address this problem and meet the highway maintenance needs of the country, the Government has started an off-budget financing arrangement by establishing a road fund. The National Highway Authority has introduced a fee-for-service system on national highways under its jurisdiction. Toll revenues and receipts from other sources specifically earmarked for highway conservation are channelled through the road fund. This article describes the management and operational procedures of the road fund.*

**Keywords:** Road fund in Pakistan, road maintenance financing, National Highway Authority, Road Maintenance Account.

## INTRODUCTION

The transport sector currently accounts for about 10 per cent of Pakistan's GDP and 17.3 per cent of the gross capital formation. It comprises 35 per cent of Pakistan's annual fuel energy consumption. The sector generates a large number of employment opportunities, currently estimated at 2.3 million jobs or about 5.9 per cent of the employed labour force.

The performance of the transport system has been poor, with high economic losses from congestion and poor road quality. The situation is aggravated by a mismatch between supply and demand for transport infrastructure and services. It is estimated that the inadequate and inefficient transport system is imposing a cost to the economy in excess of Pakistan Rupees 220 billion or about 8.5 per cent of GDP, constraining economic growth,

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reducing export competitiveness and hindering social development. Pakistan's economic development depends much on the improvement and modernization of its key transport systems. To address this issue, the transport sector has been allocated 20 to 25 per cent of the Federal Public Sector Development Programme in recent years. Despite this, road maintenance expenditure has continued to fall short of the required amount.

Pakistan inherited a limited but well functioning transport system upon achieving independence in 1947. The road network was about 50,000 km long. About a half-a-century later, the total road network has expanded to nearly 260,000 km. This huge expansion of the road network induced a dramatic modal shift with over 83 per cent of the load shifting from rail to road over this period. From 1991 to 2001, inland freight and passenger traffic grew at an average annual rate of 10.6 per cent and 4.4 per cent, respectively. Pakistan has about 5 million vehicles on the road, growing at about 8 per cent annually. This includes about 250,000 commercial vehicles.

Although the national transport system consists of three modes (road, rail and air), road transport plays an overwhelming role. The inland water transportation system is basically nonexistent and coastal shipping only serves minor local movements. Pipeline transportation is still in its initial stage of development. Consequently, Pakistan relies very heavily on road transportation to carry inland freight and passenger traffic. The total inland traffic by road and rail transport is currently estimated at 239 billion passenger-kms of passenger traffic and 153 billion ton-kms of freight traffic. Road transport accounts for 91 per cent of passenger traffic and 96 per cent of freight traffic.

An efficient transport system is a prerequisite for Pakistan to become globally competitive. The future transport development strategy, inter alia, will emphasize asset management through consolidation, upgrading, rehabilitation and maintenance of the existing system. The strategy also takes into account regional and domestic scenarios that recognize the strategic location of Pakistan in the region. It considers enhancing regional connectivity by improving links to the Central Asian republics and other neighbouring countries. In order to take the advantage of its geographic location, Pakistan needs to improve its regional competitiveness in these corridors by improving its transport system. Failure to do so will amount to a lost opportunity for the country's trade-led growth.

## I. NATIONAL HIGHWAYS AND MOTORWAYS

The National Highway Authority (NHA) is responsible for the development, operation and management of national highways, motorways and strategic roads. NHA came into existence in 1991 with an objective to plan, promote, organize and implement programmes for the construction, development, operation and maintenance of national highways and strategic roads. The National Highway Authority Act 1991, provides for the establishment of a supreme forum in the form of the National Highway Council. The Council is the supreme policymaking body for the transport sector and has the powers to control, direct and regulate the affairs of NHA. Following is the composition of NHA Council:

Composition of NHA council		
1.	Minister for Communications and Railways, Government of Pakistan	President
2.	Secretary, Finance Division, Government of Pakistan	Member
3.	Secretary, Communications Division, Government of Pakistan	Member
4.	A professional in the field of highway construction and management (nominated by the President)	Member
5.	A professional in the field of finance and accounts (nominated by the President)	Member
6.	Chairman, NHA	Member and Secretary of the Council

NHA has an Executive Board headed by its chairman and has eight other members. The Board gives general direction and executes all the administrative and operational affairs of NHA. It exercises all powers, performs all functions and undertakes all acts which may be exercised or performed by NHA. The composition of the Executive Board is as follows:

<b>Composition of Executive Board</b>		
1.	Chairman, NHA	Chairman
2.	Inspector General, National Highways and Motorways Police	Member
3.	Additional Secretary, Finance Division	Member
4.	Member or Additional Secretary, Planning and Development	Member
5.	Joint Secretary, Communications Division	Member
6.	Senior Chief, National Transport Research Council	Member
7.	Vice-President, NESPAK	Member
8.	Member (Planning), NHA	Member
9.	Member (Finance), NHA	Member

NHA has jurisdiction over about 9,000 kms of roads comprised of strategic and arterial routes that serve inter-provincial long-distance traffic. This includes roads that serve important commercial centres and major freight terminals. Although the length of national highways is only 3.3 per cent of the entire road network, they carry more than 80 per cent of the country's total road traffic.

Pakistan's national road transportation system mainly provides north-south links, connecting southern ports to the populous provinces of Punjab and the North West Frontier Province in the north. The two major north-south links are the Indus Highway (N-55) on the western bank of the Indus River and the Grand Trunk Road (N-5) on the eastern bank. The area on the western bank is mostly hilly and thinly populated. However, the area on the eastern bank is flat and the land is fertile and well irrigated. The majority of large population centres are on the eastern side of the country, concentrated along the N-5 corridor. In fact, of the eight population centres with a population of 1 million or above, seven are located along the N-5 corridor.

The current asset replacement value of the national highways is estimated at more than US\$ 10.0 billion, representing one of the largest single asset investments in Pakistan.

## II. THE CONDITION OF NATIONAL HIGHWAYS

The condition of Pakistan's road network is very poor. Travelling conditions do not meet acceptable standards. The poor conditions have been a major contributing factor to the 70 road fatalities per million people per year in the country. This is one the highest rates in the world and is imposing an estimated cost of US\$ 1 billion per year.

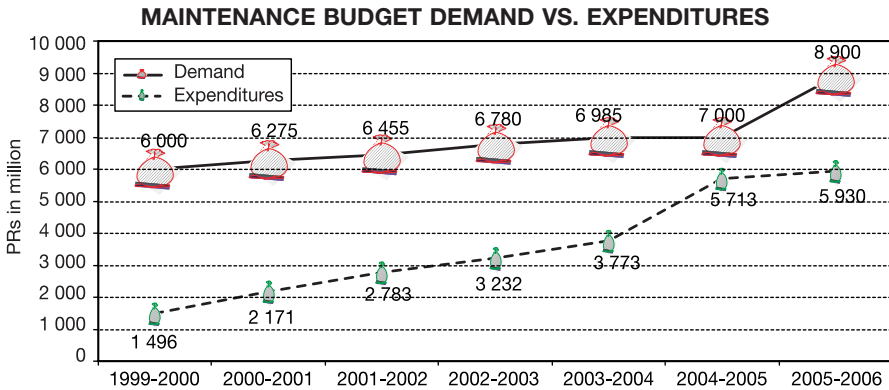


**Figure 1. Overloading of road vehicles**

Past investment in the road sector has not been adequate. Lack of adequate resources affected maintenance of roads resulting in a huge backlog in development and maintenance projects. Planning and technical capacity constraints of road agencies are, however, also partly to blame for this condition.

The rapid growth in traffic volume, increase in axle load levels (as evidenced in figure 1), modal shift from rail to road and inadequate maintenance made the large asset investment embodied in the road network deteriorate at an alarming rate. Results of the pavement condition surveys conducted in 2005 show that 43 per cent of the roads under NHA are in poor to very poor condition.

The funding needs for maintenance versus expenditures and allocations are depicted in figure 2. Although the funding situation has improved in recent years and narrowed the gap between funding needs and actual allocations, it still falls short of what is required. An investment of approximately PRs 9.0 billion per year is needed to maintain and improve the ride quality of the NHA road network.



**Figure 2. Funding needs for maintenance versus expenditures/allocations**

The Government has realized the significance of timely road maintenance to the economy. Therefore it decided that NHA must undertake maintenance of the road network, not only because it is an asset worth hundreds of billions of rupees but also because it is vital to the growth of national economy.

Accordingly, NHA has articulated a new vision that emphasizes transition from the network expansion phase to a consolidation phase. The current focus is on preservation of road assets through timely maintenance and rehabilitation of the existing network. NHA is striving to maximize road maintenance through an off-budget financing mechanism to ensure that the past mistake of under-funding road maintenance is not repeated. It is actively devising innovative off-budget financing solutions for institutionalizing an effective and sustainable road maintenance programme.

### **III. COMMERCIALIZATION OF THE ROAD SECTOR**

NHA is developing its role as a road infrastructure service provider by introducing commercialization in the road sector based on the following principles:

- Consider the principles of the market economy in road maintenance
- Undertake road maintenance based on a fee-for-service concept
- Manage road maintenance like a business rather than a government bureaucracy and promote a corporate culture within NHA.

NHA organized a national workshop to develop a consensus among the various stakeholders on achieving financial self-sufficiency and to win public support for the principle that road users should pay for the maintenance of roads in return for the service they receive. Participants attending the workshop reached a consensus on the following two matters:

- Additional revenues for road maintenance should come from road users
- Maintenance money should be channelled through a road fund

In line with the consensus reached at the national workshop, the Government took initiatives in setting up a road fund and established a mechanism for financing road maintenance from the resources generated by the fund.

### **IV. THE ROAD MAINTENANCE ACCOUNT/FUND**

The National Highway Authority Act 1991, as amended in 2001, empowers NHA to benefit from the commercial use of roads and bridges entrusted to it. Under the Act, NHA is empowered to collect tolls on national highways. The Act also grants NHA the power to collect revenues from several other designated sources. Revenues collected from such sources are deposited into Pakistan's dedicated Road Maintenance Account (RMA).

The Road Maintenance Account was established to ensure a stable and secure source of maintenance and operations funding. NHA has framed rules for the RMA known as National Highways and Strategic Roads

Maintenance Fund Account Regulations-2002. The RMA's standard operating procedures describe, inter alia, maintenance categories, and utilization of RMA money. However, funds from the federal Public Sector Development Programme may also be obtained in the case of major rehabilitation and improvements and if such funds are available.

NHA has commenced implementation of the fee-for-use concept on national highways and strategic roads under its jurisdiction. Tolls are being collected from road users on almost all major highways. NHA collects tolls directly or enters into a contract with an outside party (selected mostly through competitive bidding) for that purpose. If NHA collects tolls directly, all receipts are deposited on a weekly basis in a RMA revenue sub-account for the region from which they were collected. The regional general manager ensures the transfer of all toll money from the regional RMA revenue sub-account to the central RMA account within seven days of the beginning of every calendar month.

In cases of collection through outside parties, the revenue transfer is made according to the contract signed between NHA and the concerned party. The operations and management unit of NHA ensures effective monitoring in both cases.

The statement of receipts into RMA is prepared every month. The monthly statement includes a performance report containing a comparison with projected receipts and suggestions for improvement, if any. Twice a year, on the 10<sup>th</sup> of January and July, a consolidated account statement is made available to all the members and the Chairman of the Executive Board for budgeting purposes. Central and regional RMAs are reconciled on a regular basis.

NHA has established tolling stations collecting tolls on almost all national highways and has started charging for the commercial use of right-of-way by collecting ground/approach rental charges. The policy guidelines for tolls and charges for the commercial use of right-of-way were approved by the NHA Executive Board as an interim measure until the final approval is made. The Board has constituted a committee to finalize the policy for tolling and preservation/commercial use of right-of-way.

It is expected that the total revenue generated for maintenance works in the financial year 2005-06 will be about PRs 4,310 million. The estimated funding requirement, determined through Highway Development and Management (HDM-IV) analysis, for the year will be PRs 7,000 million. Available total resources from different sources are expected to be as follows:



- Revenue receipts through RMA from all designated sources, PRs 4,730 million
- Government grants for maintenance, PRs 1,200 million
- Total resources available, PRs 5,930
- Shortfall, PRs 1,070 million

Toll revenue is the primary contributor of RMA resources. The contributions of different sources into RMA are as follows:

- |                                  |   |               |
|----------------------------------|---|---------------|
| ● Toll plazas                    | : | 92.0 per cent |
| ● Weigh stations                 | : | 1.5 per cent  |
| ● Right-of-way commercialization | : | 1.2 per cent  |
| ● Hoardings/billboards           | : | 0.3 per cent  |
| ● Police fine collection etc.    | : | 5.0 per cent  |

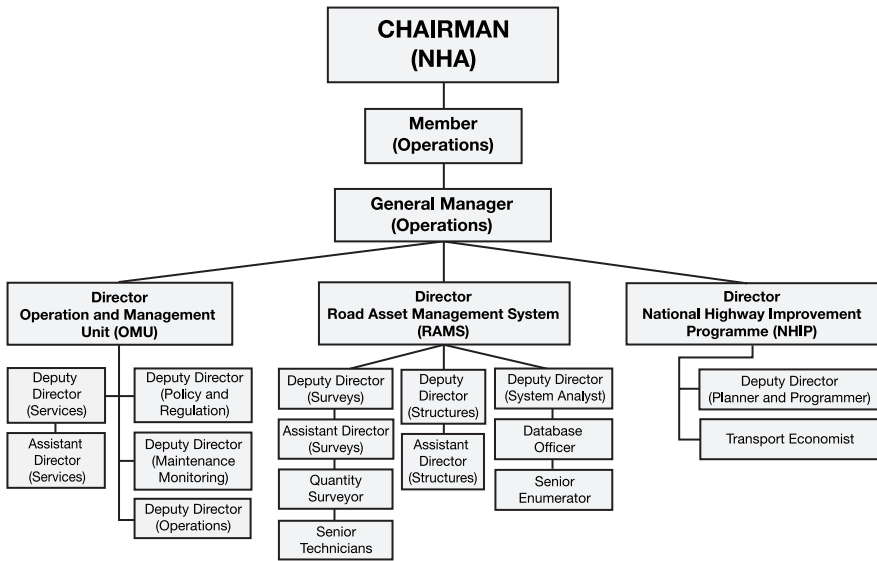
## **V. MANAGEMENT OF RMA**

The Road Asset Management Directorate (RAMD) was established in April 2000 within NHA for better management of road maintenance activities and revenue generation through RMA. RAMD provides the necessary system and human resources to ensure adequate generation of revenues, conservation of road assets and quality infrastructure services to road users. Under the new maintenance regime, the road user must be treated as a customer. Road user satisfaction is of primary importance for the promotion of “fee-for-road service concept”.

The Organizational Structure of the RAMD unit is provided in figure 3. The General Manager (Operations) also acts as the Executive Director of RAMD. RAMD is functionally divided into three main components:

- Operation and Management Unit (OMU)
- Road Asset Management System (RAMS) Unit
- National Highway Improvement Programme (NHIP) Unit

The aim and function of OMU is to generate revenue through commercial use of road assets. The RAMS unit is responsible for preparing and managing the implementation of maintenance programmes, whereas the NHIP unit is responsible for coordinating donor agency programmes and promoting private sector participation and commercial operations.



**Figure 3. The organizational structure of the Road Asset Management Directorate**

The RAMS unit prepares an annual maintenance plan (AMP) and strategic business plans for the annual and future maintenance of the highways. It also provides a prioritized list of road links, for which the service providers (NHA’s six regional offices supported by a number of other field offices) are required to prepare their proposed programme. This list will have clear and concise reasons for the order in which works estimates should be prepared. The list will form an integral part of an NHA-approved programme design. The design will give clear and concise guidelines on what should be addressed in the maintenance works, and what should be left out.

The whole process of estimating the maintenance works follows a set of procedures which are open and transparent and involve the senior management from both the planning and highway divisions within NHA. The level and depth of work to be included are determined by considering road classification, the constructed asset value and the recommended periodic intervention as estimated by the Maintenance Modelling System of HDM or similar tools.

The expenditures from the RMA cover the following maintenance categories:

- Routine, periodic and emergency maintenance
- Rehabilitation
- Geometric improvement and highway safety improvement
- New toll plazas and weigh stations
- Corridor management

## **VI. THE ROAD ASSET MANAGEMENT STRATEGY**

The road asset management system of RAMD has developed a cyclical operations system. The system has the key role for the following functions:

- Conducting an annual network analysis
- Updating the existing central road databank
- Developing an annual business plans
- Identifying maintenance activities with high potential for maintaining asset values
- Estimating the current asset value of the network
- Preparing annual profit/loss statements for the network after each year's analysis

The network analysis process involves the following activities:

- Forecasting of revenue generation/investment
- Distress survey of roads and bridges
- Roughness measurement survey
- Strength evaluation survey
- Traffic survey
- Collection of historical data
- Assessment of performance standards and treatment rules

The annual work cycle followed by RAMS is presented in figure 4.

ID	Task Name	2 <sup>nd</sup> Half						1 <sup>st</sup> Half						2 <sup>nd</sup> Half			
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
1	Data Collection	01 July		15 September													
2	Strategy and Programme Analysis	16 September		15 October													
3	Regional Stakeholder Consultations			16 October						15 November							
4	Detailed Project Level Appraisal			16 November						31 December							
5	Scrutiny by RMF Technical Scrutiny Party			01 January						07 January							
6	Review by the Steering Committee			08 January						14 January							
7	Approval by Chairman, NHA or Executive Board			15 January						30 January							
8	Conveyance of Approval to Regions and HQ Contracts Section									31 January							
9	Up-Dation of Maintenance Contractors Enlistment List			01 February						28 February							
10	Preparation of Detailed Tender Packages by Regions			01 February						31 March							
11	Bids Invitations, Evaluation, and Contract Awards									01 April						31 May	
12	Commencement and Completion of RMF Works	01 July														30 Jun	

**Figure 4. Work cycle of the road asset management system**

## VII. MANAGEMENT OF THE ROAD MAINTENANCE ACCOUNT

It is mandatory to obtain administrative approval from the competent authority before funds from the Road Maintenance Account can be allocated for eligible expenditures. The approval is made after considering the scope of work, its rough cost estimate and its necessity.

RAMD prepares a draft annual maintenance plan (AMP) for the Technical Scrutiny Party (TSP) of RMA, who after careful examination, submit the AMP to the RMA’s steering committee. The steering committee reviews and forwards the AMP for approval of the Chairman and the Executive Board.

RAMD conveys administrative approval for the projects finally included in the annual programme. This information is used for preparation and competitive procurement by the regional offices and the contract section at NHA headquarters. Regional offices and the contract section at the headquarters, update records of maintenance contractors and prepare detailed tender documents.

The financial statements and accounts of RMA are audited annually by an independent and reputable firm of chartered accountants engaged by the NHA Executive Board. The printed audit report is submitted to the NHA

Executive Board within five months of the end of every financial year. The NHA Executive Board also periodically engages an independent reputable firm or a professional individual for undertaking a technical audit of the activities financed by the RMA.

### **VIII. IMPLEMENTATION OF THE ANNUAL RMA PROGRAMME**

Regional offices and the contract section at the headquarters invite tender biddings for road maintenance works, evaluate bids and award contracts to winning bidders. If bid prices are considered high due to lack of “effective” competition, the competent authority may instruct re-tendering from a wider contractor pool.

The maintenance works cycle commences from 1 July of every calendar year and is completed before the end of the same financial year. The financial year ends on 30 June of the next calendar year. Except where notified by the competent authority at the time of administrative approval, regional offices are responsible for the supervision of maintenance contracts financed from RMA. They send monthly progress reports to RAMD in an agreed format.

Changes in contract specifications are not allowed after the work is awarded. However, if such a change is warranted on extremely solid technical grounds, it requires prior approval of the competent authority. Revised technical sanction and administrative approval are also necessary if the project costs exceed 15 per cent.

### **IX. MANAGEMENT INFORMATION SYSTEMS AND PERFORMANCE INDICATORS**

RAMD carries out performance monitoring of the works through the regular review of monthly progress reports and random field visits during each maintenance year. It submits a summary of these reports to the Chairman and the NHA Executive Board.

RAMD submits summary outputs of the Highway Development and Management (HDM) strategy analysis and recommendations for adjustments in resource mobilization, if any, to the NHA Executive Board through the Chairman. It monitors key performance indicators at the network level and includes them in its annual report to the Chairman and the Executive Board.

The Directorate prepares a comprehensive annual report on its activities. The annual report includes details of data collection; programme development including strategy and prioritization; stakeholder consultations; programme appraisal, scrutiny, review and approval process; procurement of works, goods and services; implementation of the approved programme; achievement of targets; and all other activities specified in the RMA Rules.

## X. IMPROVEMENT ATTAINED THROUGH RMA

The following major achievements have been made by implementing RMA from 2000 to 2005:

- **Roughness** : Reduction in IRI from 6.0 to 5.0
- **Road condition** : NHA network in poor condition reduced from 59 per cent to 43 per cent
- **Economic saving** : Reduction in vehicle operating costs amounting to savings of over PRs 50 billion
- **Travel time** : Approximately 7 per cent reduction in travel time
- **Safety** : Improvement in road safety conditions

## CONCLUDING REMARKS

Over the last five years, enhanced financing of road maintenance has considerably improved road conditions, safety and travel time. However, available resources through the current financing mechanism still fall short of meeting maintenance funding needs. For this reason NHA will have to enhance its revenue generation by bringing more road sections under tolling, by increasing the existing toll rates and by promoting commercial activities along highways. Consideration should also be made to set up a road development fund in order to meet the costs of new road development projects, such the North-South Motorway Corridor. In order to secure the continuing support of road users for the fee-for-service concept, the current level of service on national highways also needs to be improved. Introduction of the corridor management concept with greater private sector involvement, enhanced safety and security measures on roads and application of new technologies, such as intelligent transport systems, can help to improve the level of road transport service in the country and enhance its economic competitiveness.