

# **Road Asset Management System adopted by National Highway Authority Pakistan**



**Ministry of Transport, PRC  
Central and West Asia Transport and Communication Division, ADB  
CAREC Institute**

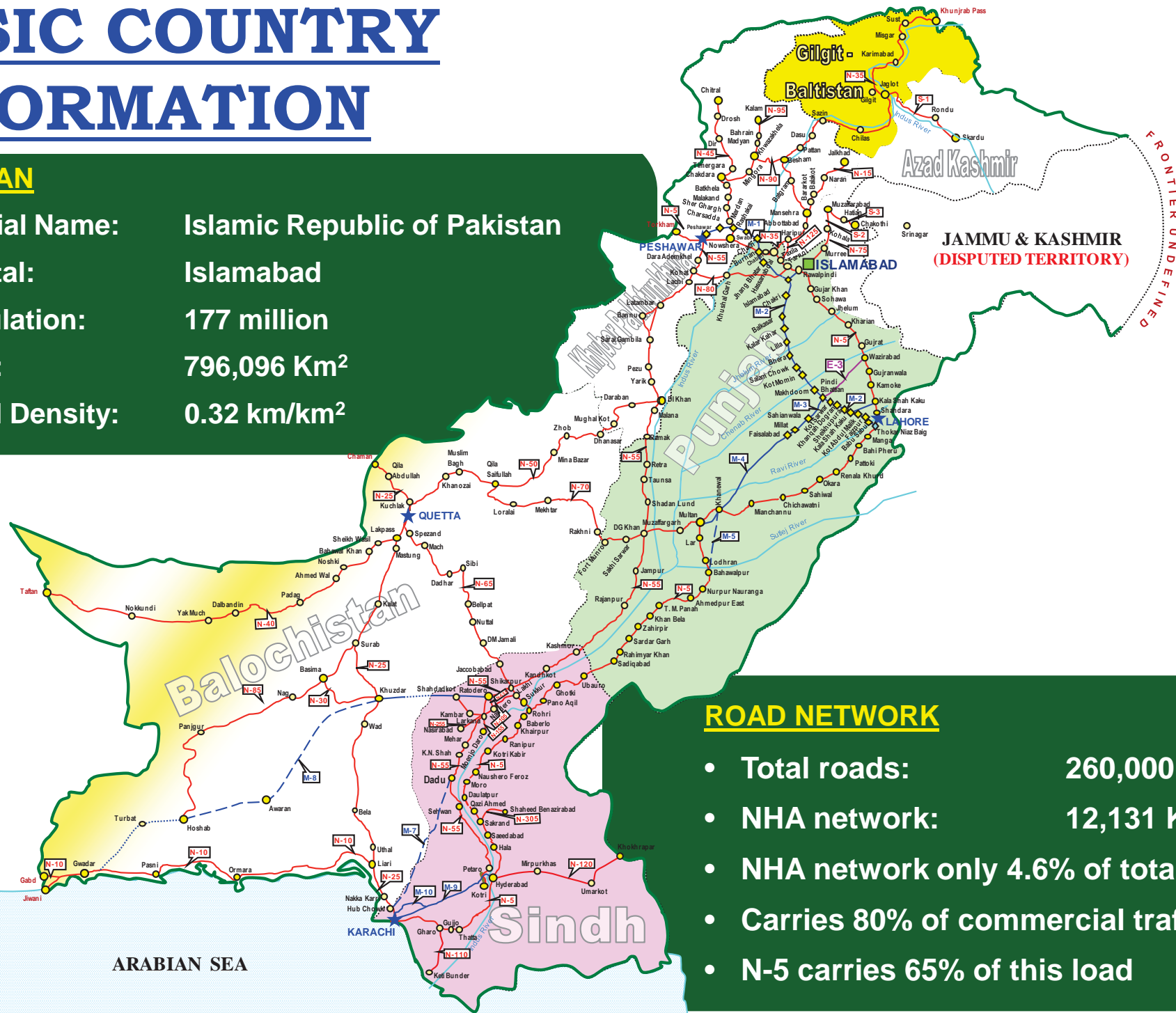
**Beijing, People's Republic of China  
27-29 November 2012**



# BASIC COUNTRY INFORMATION

## PAKISTAN

- Official Name: Islamic Republic of Pakistan
- Capital: Islamabad
- Population: 177 million
- Area: 796,096 Km<sup>2</sup>
- Road Density: 0.32 km/km<sup>2</sup>



## ROAD NETWORK

- Total roads: 260,000 Km
- NHA network: 12,131 Km
- NHA network only 4.6% of total roads
- Carries 80% of commercial traffic
- N-5 carries 65% of this load

# **MISSION STATEMENT OF NHA FOR ROAD MAINTENANCE / PRESERVATION**



**To maintain and operate the National Highways and Strategic Roads to minimize the road transportation costs, provide driving comfort and safety to the road users at all times, and preserve the asset investment in roads, bridges and appurtenances cost effectively.**

## **NHA EXISTING ROAD MAINTENANCE**

**NHA has embarked upon a program of Resource and Road Asset Management in its endeavors to improve the serviceability and value for money that it requires from its highway network.**

**This is the modern approach to road management much favored in the countries where budgets for the care and repair of roads are always in deficit.**

**Every road network has a Book Asset Value at the start of the year. This is made up of:**

- The value of the existing pavements as constructed, and then down valued according to (i) their present condition and (ii) the cost of putting them in the minimum acceptable condition.**
- The stock value of the structures based upon their replacement value.**



# NHA EXISTING ROAD MAINTENANCE



Based upon available resources and the priorities of serviceability, an annual program of care, conservation and upgrading of the road network then takes place. This program of works is the investment being made in the road network.

An analysis at the end of the following year of the road conditions and hence the prevailing asset values reflects the downward valuation of roads that have deteriorated further (due to no intervention) and the upward valuation of those sections receiving investments in the form of conservation or improvement programs and gives an overall picture of increase or decrease in remaining service life of the road network.

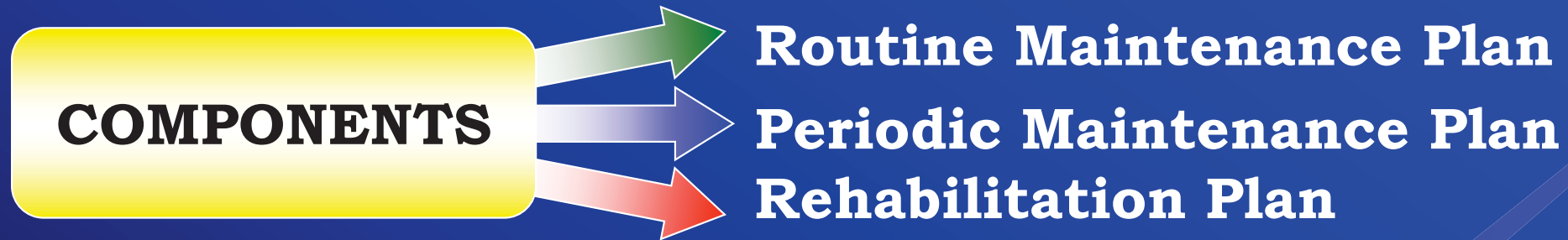
## STRATEGY OF ROAD ASSET MANAGEMENT SYSTEM (RAMS)

- conducting Annual Network Analysis process.
- development of Existing Central Road databank.
- development of Annual Business plans.
- Target all Maintenance Activities as investments Making them to be cash specific.
- developing the current Asset Value of the Network.
- financial and Technical Audit (performance indicators evaluation) for each Annual Maintenance plan.





# THE ANNUAL MAINTENANCE PLAN



## Theme Of Annual Maintenance Plan

- Each 'Rupee' spent must be a Carefully considered investment for each kilometer in the long-term conservation of an infrastructure asset.
- All maintenance works will have to be qualified before financing.
- The "Short Term Focused Plan" aimed at achieving the objectives of "Long Term Strategic Plans"

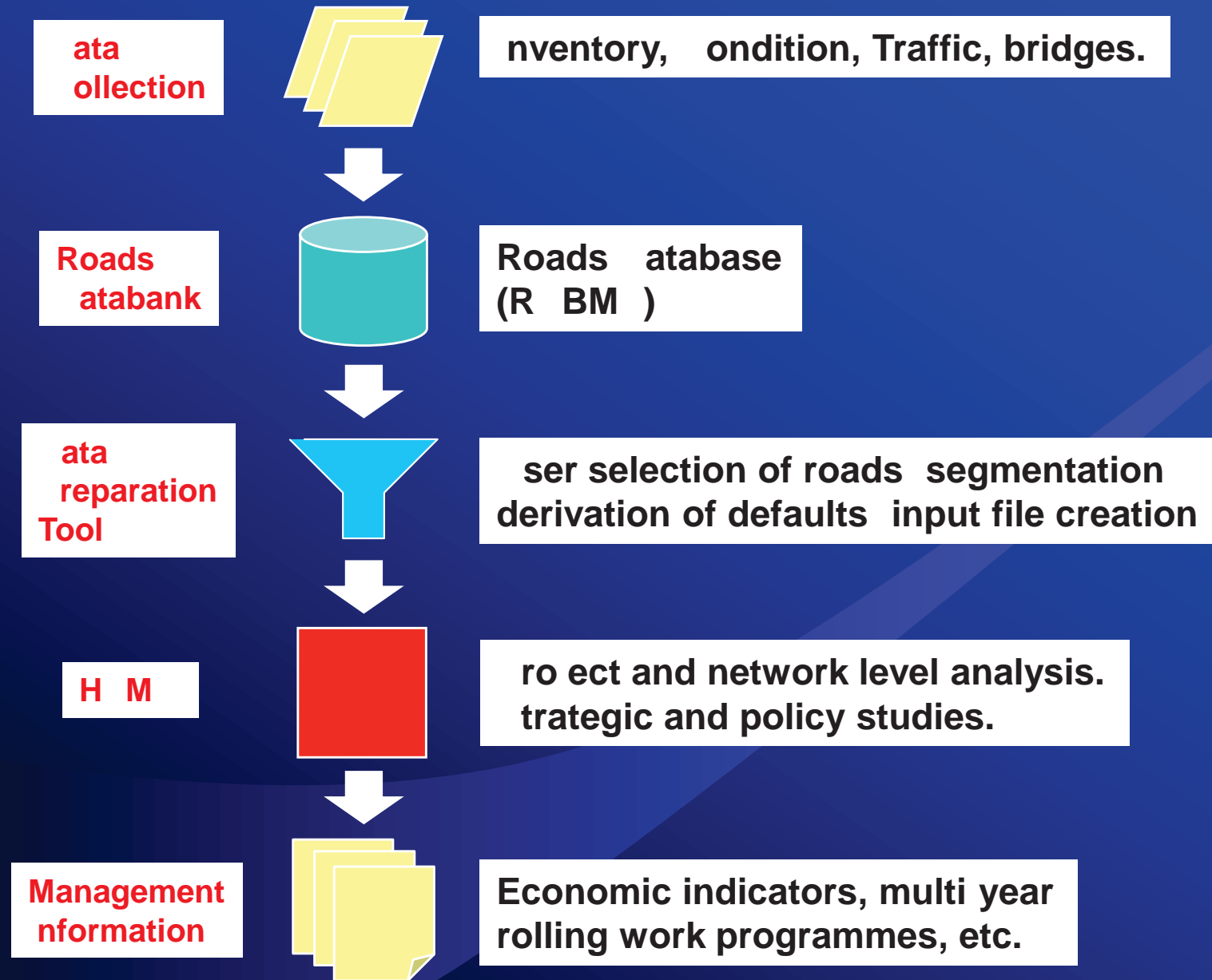
# **EXISTING SYSTEM;**

## **ANNUAL MAINTENANCE PLAN COMPRISES OF:**



- **Routine, Periodic (Functional/Structural) Maintenance**
- **Rehabilitation of existing national highway network assets which have acceptable net present value (NPV)/Economic Rate of Return (ERR), a social benefits**
- **Geometric improvements of existing national highway network**
- **Highway Safety improvements**
- **Corridor Management**
- **Establishment of automated toll plazas and Weigh Stations**
- **Access controlled bypasses, Traffic Management and provision of road users facilities**
- **Development of urban areas which includes service roads, parking lots, taxi ways, bus bays with toilets and drinking water facilities, telephone services etc.**
- **The maintenance of NHA network is through “**MAINTENANCE-BY-CONTRACT BASIS**”**

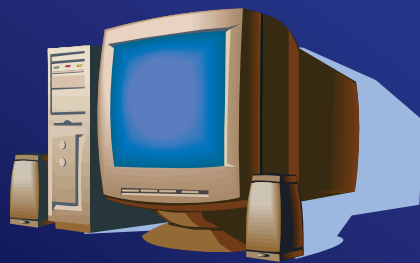
# Integration within a Road Management System



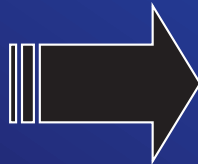
# NHA RAMS DATABASE



GIS System



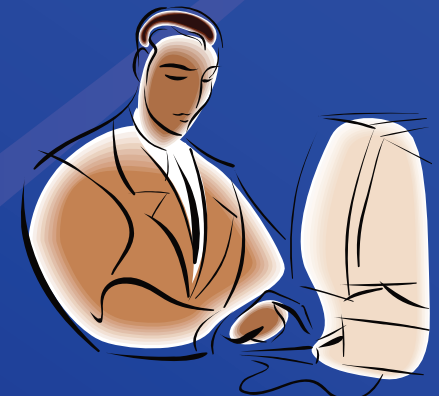
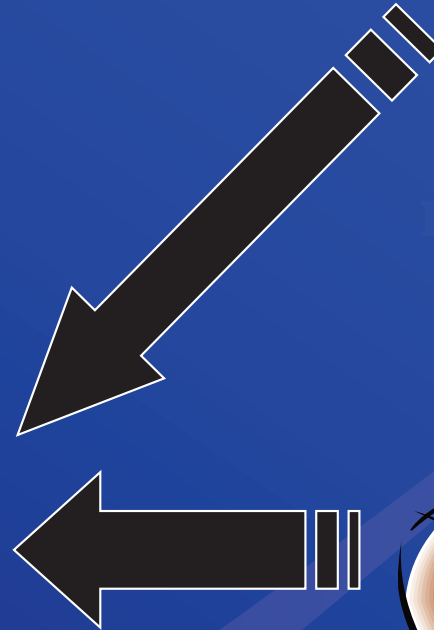
Bridge  
Management  
System



Road Database



Contract Management  
System



Pavement  
Management  
System



# Advantages of Road Management System

- **Money spend on need basis.**
- **Reduces overall vehicle operating cost, thus by improving road network condition and reducing average road roughness.**
- **Reduction in average travel time.**
- **Reduction in rehabilitation cost and increase in investment particularly routine & preventive maintenance.**
- **Effective and efficient monitoring of maintenance works and its requirement.**

# Disadvantages of Road Management System



- **Centralized System in which all stakeholders needs to be brought into the loop which is a difficult task.**
- **The funding available is always less than requirement, therefore, maintenance backlog is created.**

# **KEY ISSUES**



Issues	Measures
<b>Thinning of Resource Envelope and Time/Cost over-runs.</b> <b>Sustainable Financing of NHA's Program</b>	<ul style="list-style-type: none"> <li>➤ Increase in grant from MOC</li> <li>➤ Explore new avenues of revenue generation</li> <li>➤ Mechanism to stop leakages in toll revenue</li> </ul>
<b>No axle load controls and weak regulatory framework.</b>	<ul style="list-style-type: none"> <li>➤ Installation of new weigh stations</li> <li>➤ Strict implementation of NHSO-2000</li> <li>➤ Provision of impounding areas</li> <li>➤ Imposition of heavy penalties to discourage overloading</li> </ul>
<b>Neglected Essential Maintenance due to funding constraint</b>	<ul style="list-style-type: none"> <li>➤ Implementation of Annual Maintenance Plan in its true spirit.</li> <li>➤ More emphasis on preventive maintenance &amp; rehabilitation rather than reconstruction</li> </ul>
<b>Contractor's &amp; Consultant's Capacity</b>	<ul style="list-style-type: none"> <li>➤ Training / seminar / workshop programs for all stakeholders</li> </ul>
<b>Abnormal Inflation / Price Escalation</b>	
<b>Law &amp; Order Situation</b>	





# PHOTOS



# Pictorial View of Pavement Condition Survey

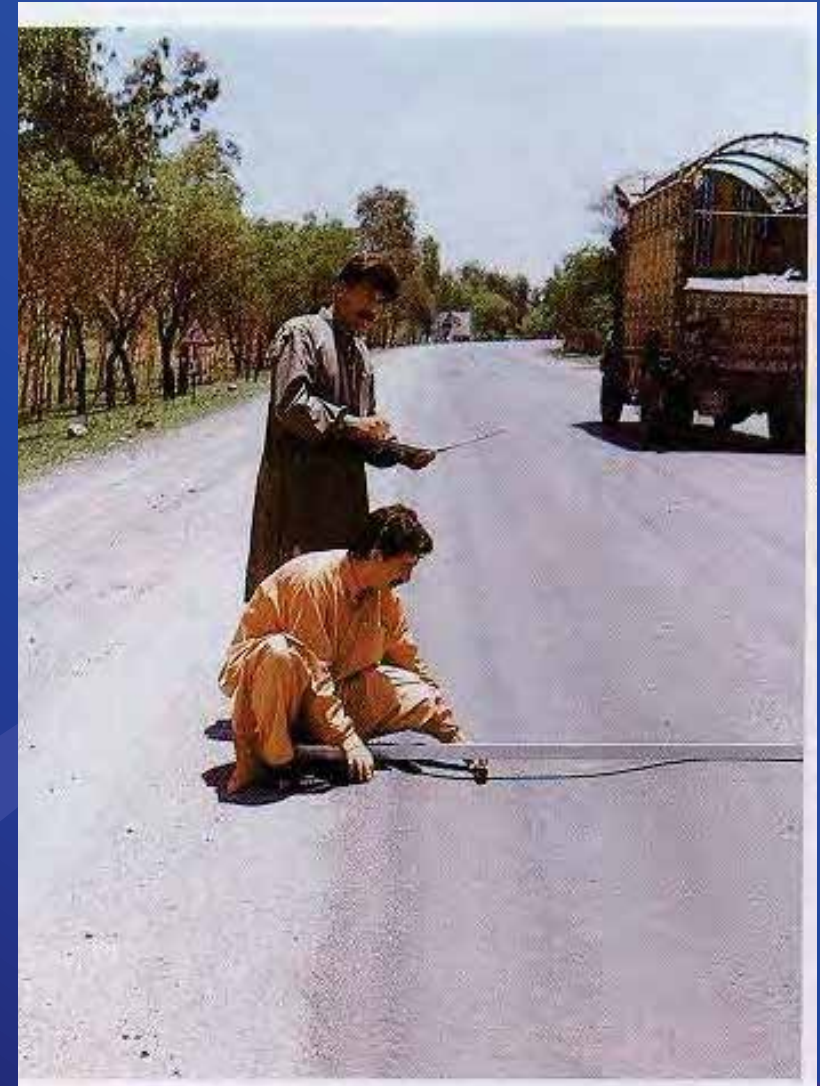




# Pictorial View of Pavement Condition Survey



Figure 4. PAVEMENT CONDITION SURVEY (CRACK MEASUREMENT)







# PICTORIAL VIEW CONDITION SURVEY









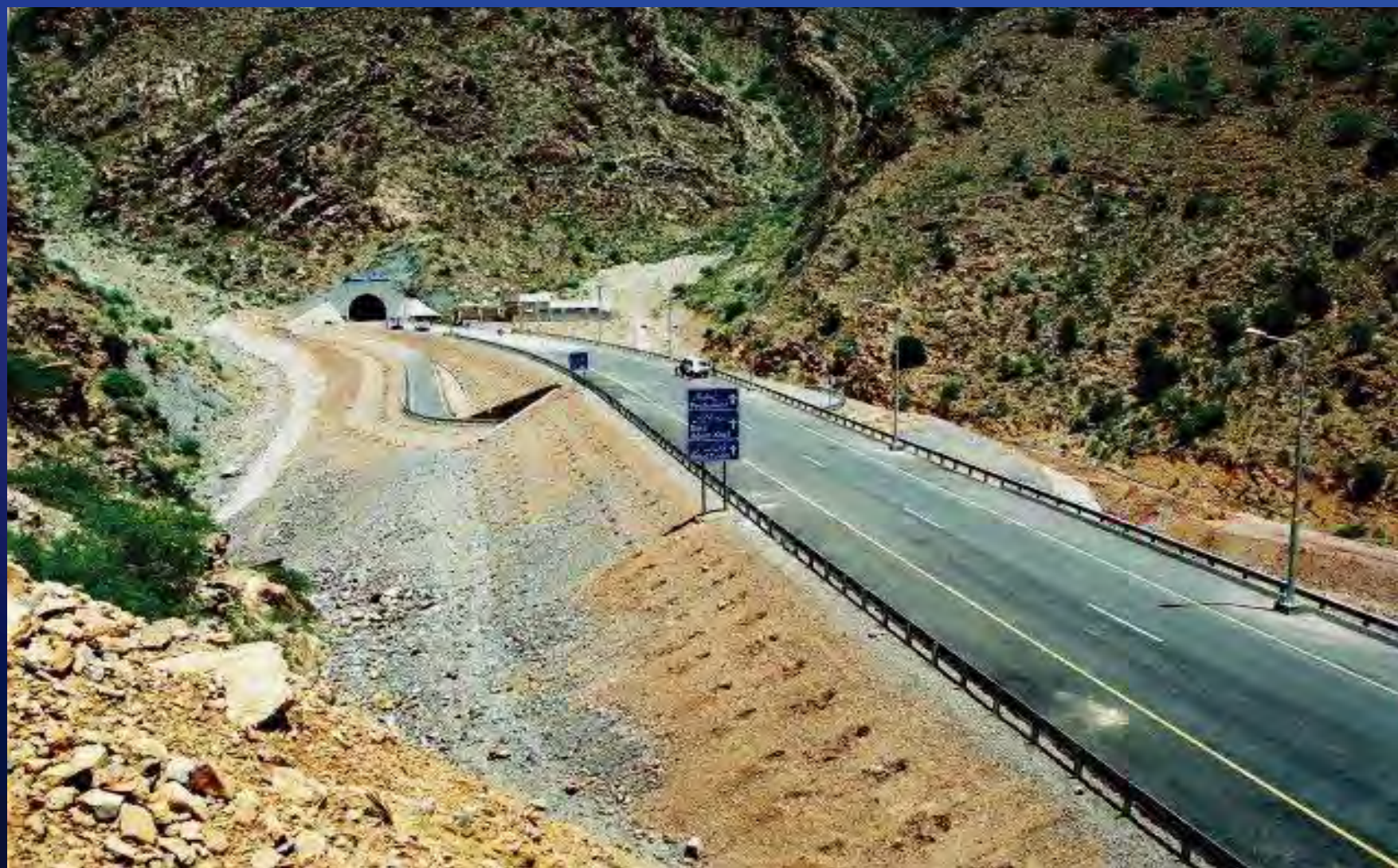






















# *THANK YOU*





# Annual Maintenance Cycle



ID	Task Name	2nd Quarter			3rd Quarter			4th Quarter			1st Quarter			2nd Quarter			3rd Quarter			
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug		
1	Data Collection				September 15						November 15									
2	Strategy and Programme Analysis							November 16						December 16						
3	Regional Stakeholder Consultations							December 17						January 16						
4	Detailed Project Level Appraisal								January 17						March 3					
5	Scrutiny by RMA Technical Scrutiny Party											March 4			March 10					
6	Review by the Steering Committee											March 11			March 17					
7	Approval by Chairman NHA and NHA Executive Board											March 18			April 2					
8	Convey of Approval to Regions												◆ April 3							
9	Updation of Maintenance Contractors Enlistment											April 4			May 2					
10	Preparation of Detailed Tender Packages by Regional Offices											March 19			April 15					
11	Bids Invitation, Evaluation & Contract Awards											April 16						June 16		
12	Commencement and Completion of RMA Works		July 1																June 30	