



# ASSET MANAGEMENT: TECHNICAL INPUTS TO DECISION MAKING

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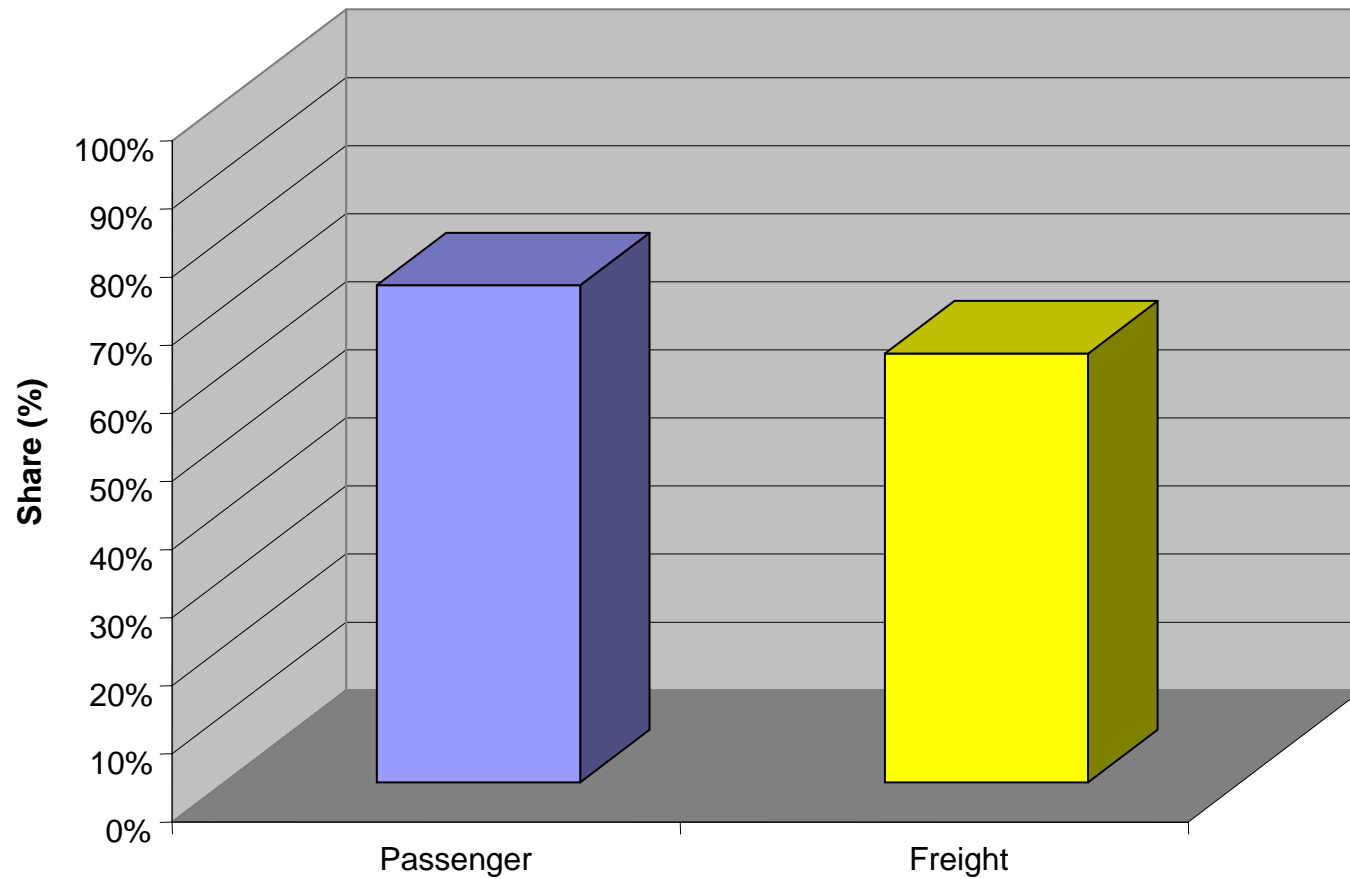




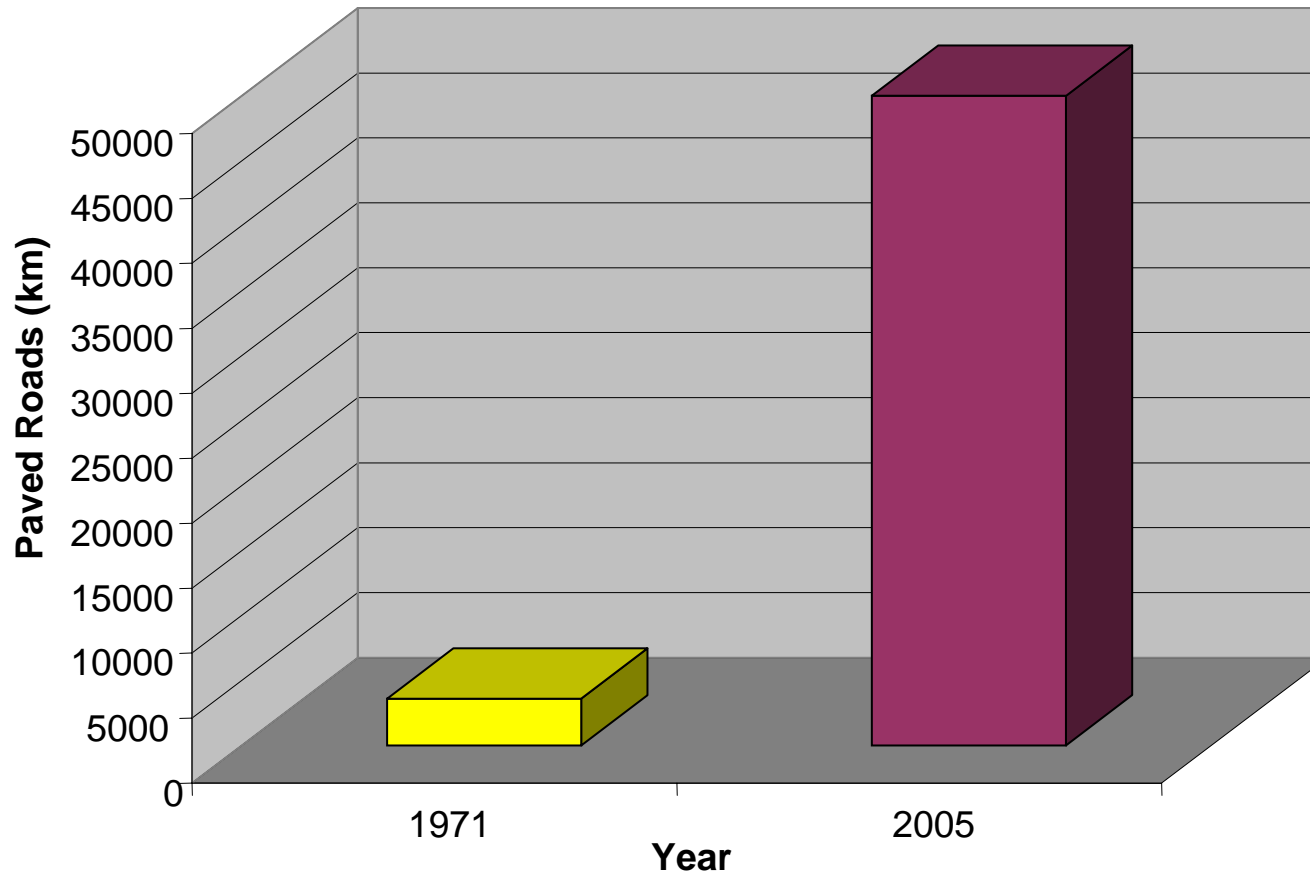
## Contents:

- **Road Agencies in Bangladesh**
- **Pavement Management System (PMS) adopted by agencies**
- **Maintenance policy**
- **Conclusions**

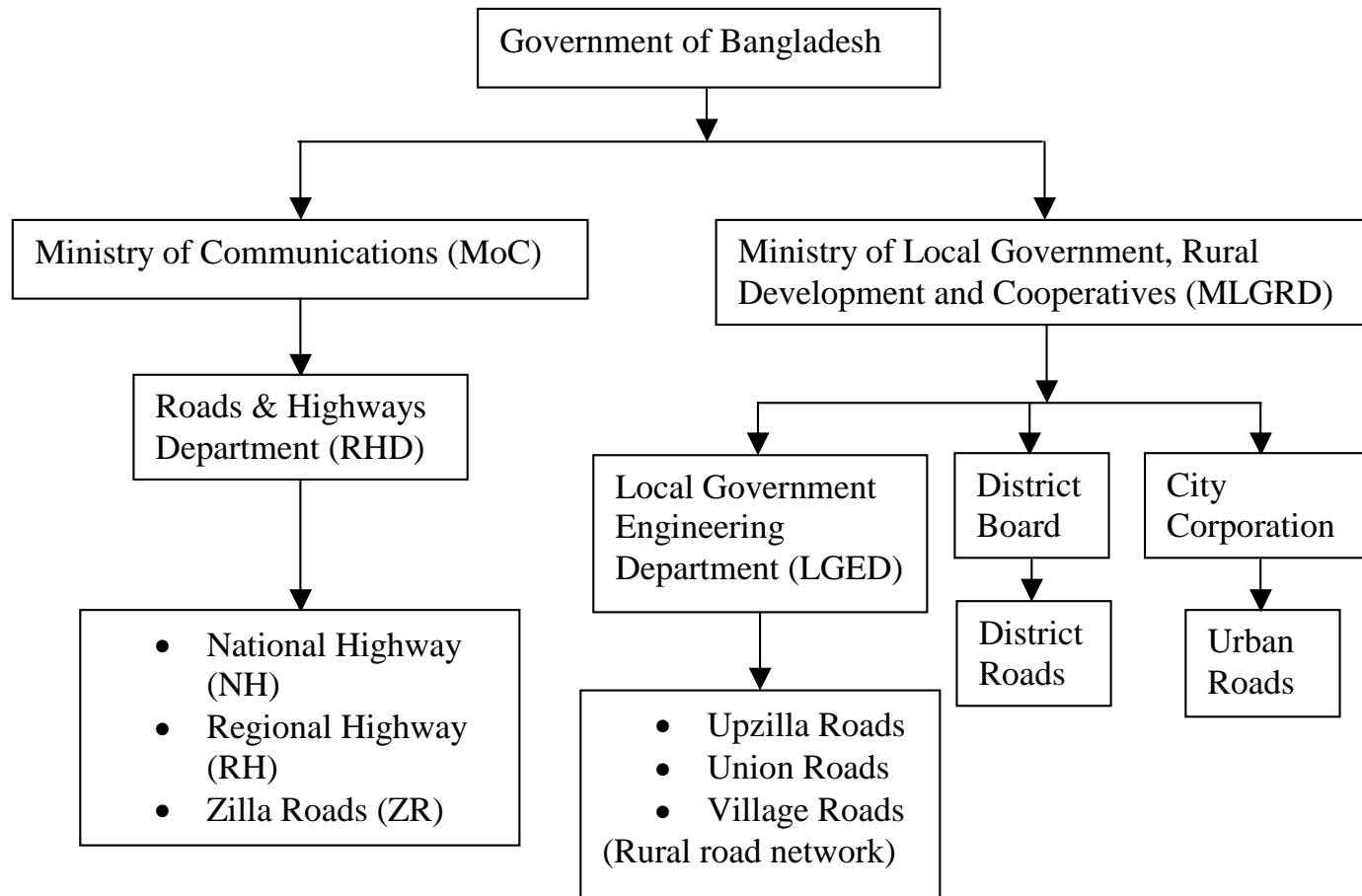
# Road Transport in Bangladesh:



# Paved Road Network:



# Road Agencies in Bangladesh:



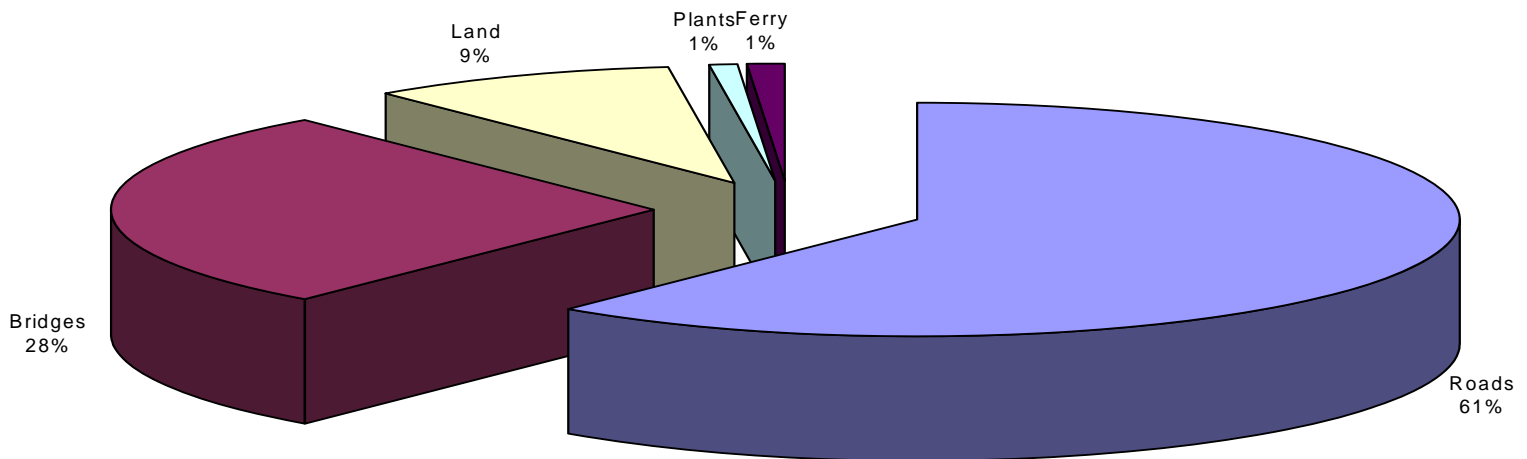
# Table: Road network in Bangladesh

Road type	Typical Flow Rate	Length (km)	Responsibility	Comments
National Highway	Connecting capital to districts and ports	3,529	RHD	RHD network is of 20,782 km of which about 17,434 km are paved. These are major roads in the country.
Regional Highway	Connecting district to districts	4,127	RHD	
Zilla Roads	Connecting district to upzilla and upzilla to upzilla	13,126	RHD	
Upzilla road	Connecting upzilla to upzilla and upzilla to union	36,166 (17,889 km are paved)	LGED	LGED network is of 249,830 km of which about 33,987 km are paved. These are rural roads in the country.
Union road	Connecting union to union	42,329 (8,515 km are paved)	LGED	
Village road	Connecting union to village and village roads	171,335 (7,583 km are paved)	LGED	
City road	Urban roads in the metropolitan cities	3,200	City Corporation	These are urban roads.

Source: Road Fund Establishment Office, 2006

# Road Asset Value:

- Asset value of RHD: US\$7,400 million
- Paved road asset of RHD: US\$3,700 million
- Paved road asset of LGED & others: US\$ 4,300 million



# Recent Road Condition:

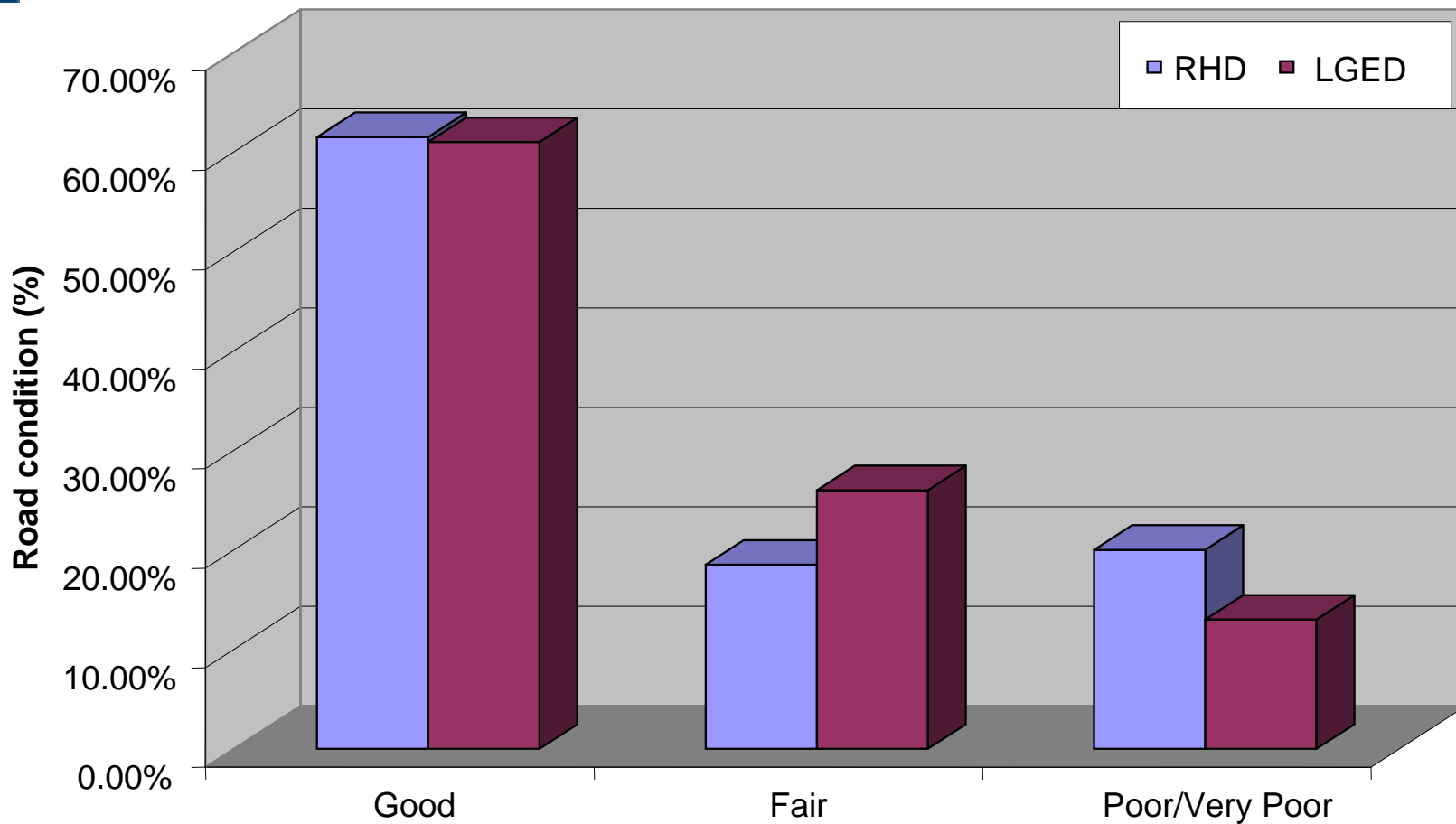


Figure: RHD and LGED recent road condition (RFEQ, 2006)



# Asset Management:

- **Road maintenance is needed to manage road asset management.**
- **Non-maintenance of roads slows GDP by 1%.**
- **Economic Internal Rate of Return of Periodic Maintenance works is much higher than new construction.**

# Components of Asset Management:

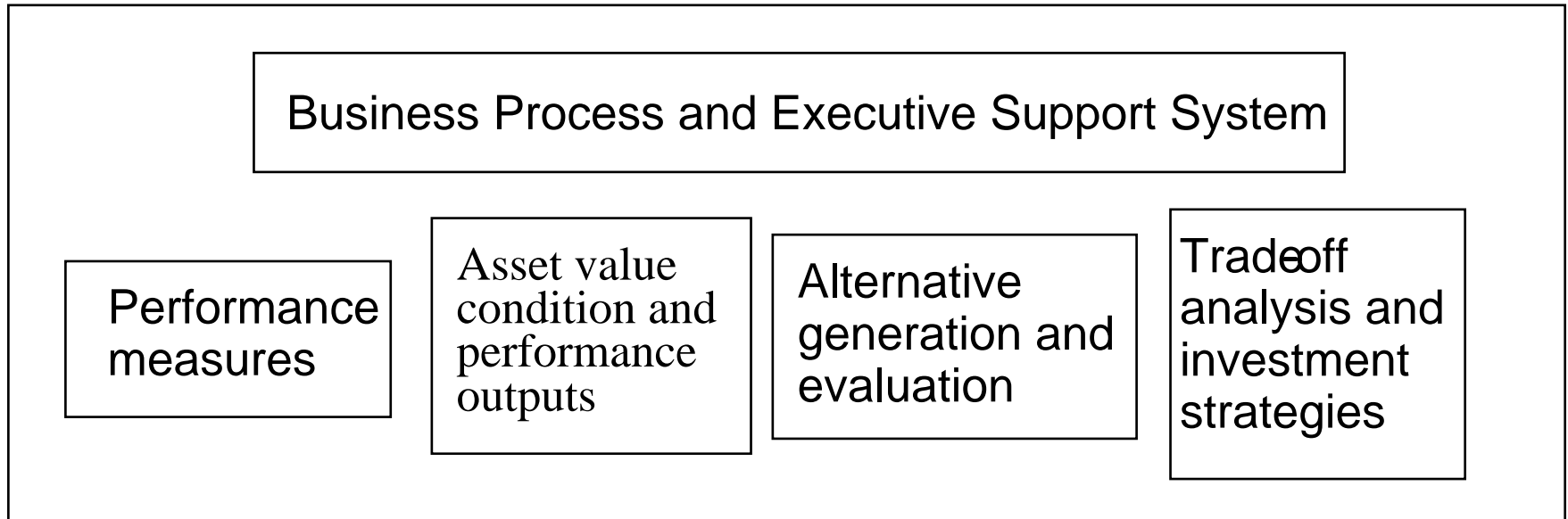
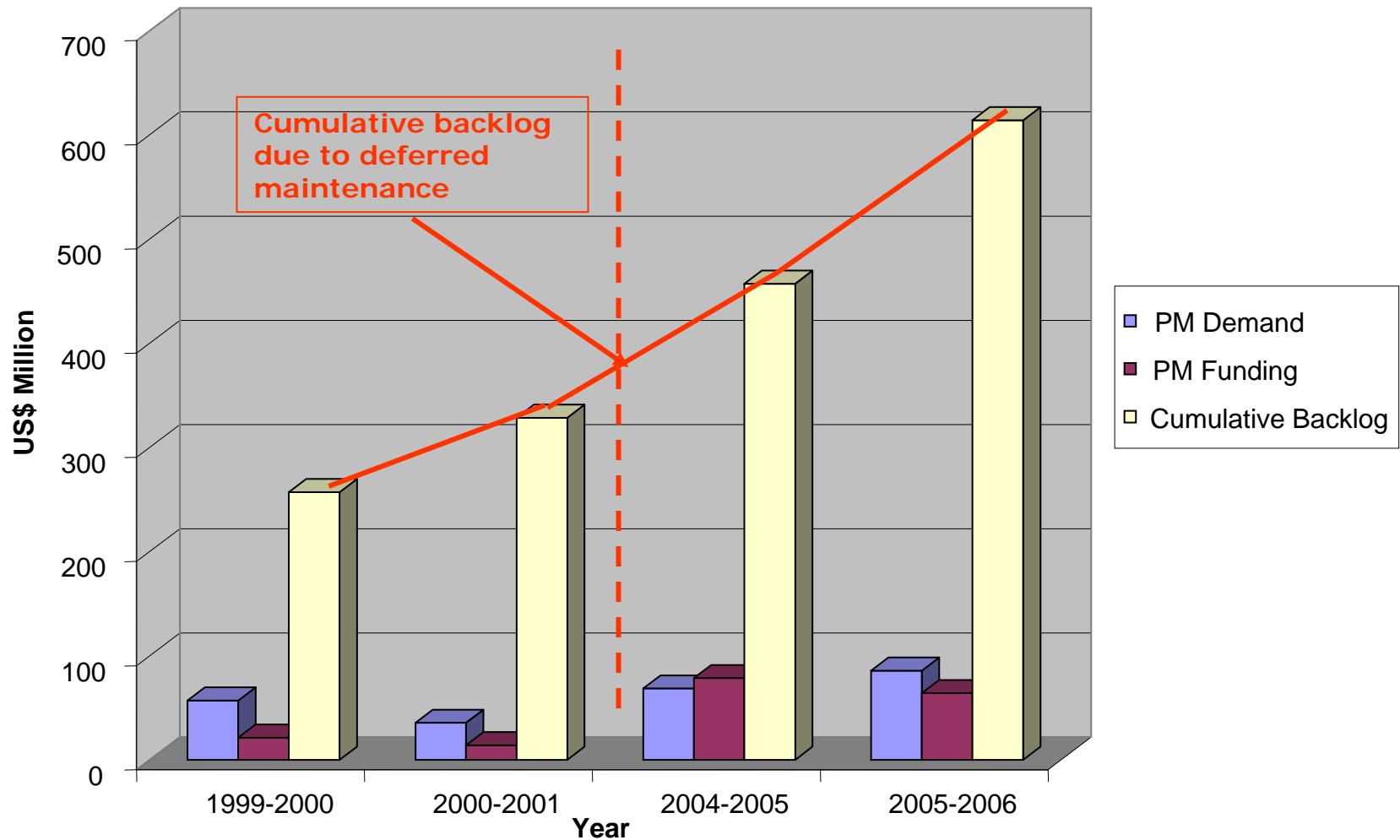
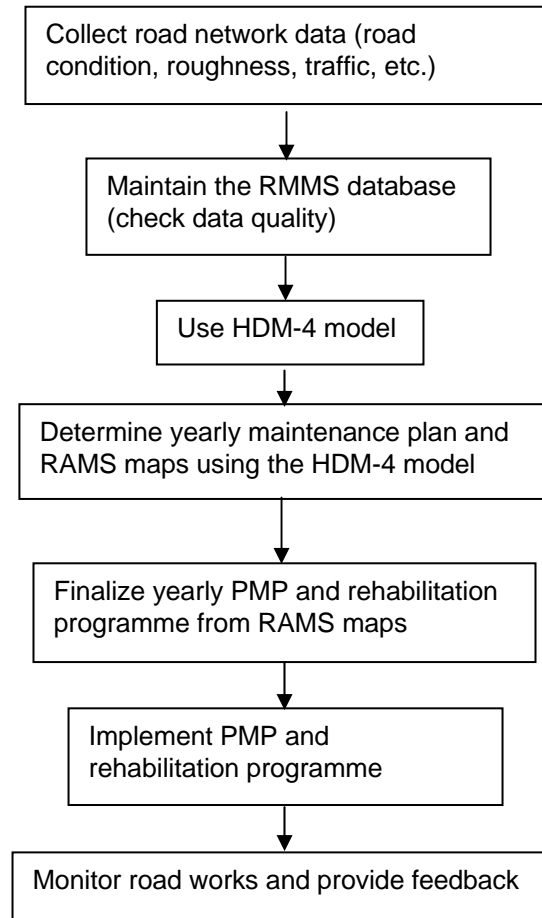


Figure: Asset management components (PIARC, 2005)

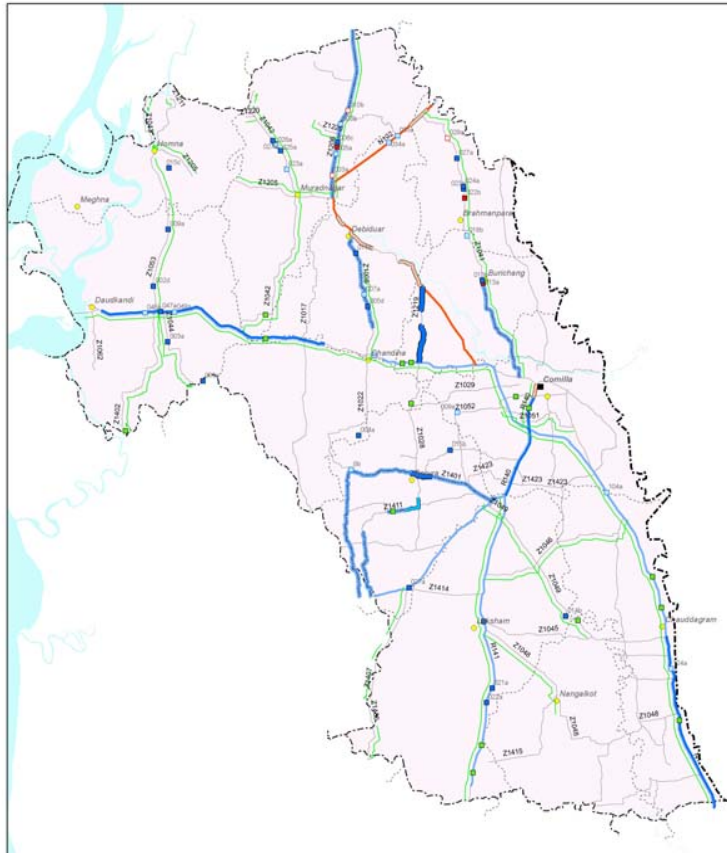
# Demand, Funding & Backlog at RHD:



# RHD-PMS:



# RHD-RAMS Map (Sample):



**RAMS Options for 2006 in Comilla Division**

Road Option	Road No	Start	End	Work Length (km)	Work Cost (Million)	Remarks
	N102	0.00	10.00	10.00	10.00	BCPS
	N102	10.00	21.00	11.00	7.40	BCPS
	N102	21.00	22.00	1.00	1.00	BCPS
	N102	23.00	36.00	13.00	10.70	BCPS
	N102	36.00	39.40	3.40	2.50	BCPS
	N102	39.40	40.00	0.60	0.50	BCPS
	N1	0.00	6.00	6.00	6.00	BCPS
	N1	6.00	10.00	4.00	4.00	BCPS
	N1	10.00	120.00	110.00	45.00	BCPS
	N1	120.00	150.00	30.00	19.10	BCPS
	N140	1.00	12.00	11.00	10.88	BCPS
	N140	12.00	30.00	18.00	26.21	BCPS
	N141	0.00	31.720	31.720	34.80	BCPS
	N144	0.00	4.000	4.000	4.00	BCPS
	N1008	0.00	13.800	13.800	10.21	BCPS
	N1041	0.00	12.800	12.800	21.46	BCPS
	N1219	0.00	9.000	9.000	7.50	BCPS
	N1401	7.000	10.000	3.000	2.48	BCPS
	N1401	10.000	32.000	22.000	28.61	BCPS
	N1811	0.00	14.00	14.00	10.16	BCPS
	N1811	14.00	17.00	3.00	2.50	BCPS

Bridge Option	Road No	BRP ID	Length (m)	RAMS Code	Cost (Million)	Remarks
	Z1041	LRP020	4.00	BCB	18.88	
	Z1041	LRP020	21.30	BCB	81.84	
	Z1041	LRP020	14.00	BCB	62.72	
	Z1036	LRP009	11.50	BCB	50.72	
	Z1036	LRP009	23.00	BCB	89.48	
	N1	LRP049	3.90	SPR	0.73	
	N1	LRP049	6.50	SPR	28.67	
	N1	LRP049	15.90	SPR	0.00	
	N1	LRP079	23.10	SPR	1.81	
	N1	LRP124	9.10	SPR	0.42	
	N102	LRP054	3.00	SPR	0.51	
	N102	LRP054	35.30	SPR	1.58	
	N102	LRP074	2.90	SPR	11.47	
	N141	LRP013	1.20	SPR	0.29	
	N141	LRP074	11.70	SPR	47.19	
	N109	LRP020	7.90	SPR	34.40	
	N109	LRP004	12.25	SPR	54.02	
	N109	LRP014	3.00	SPR	18.13	
	N102	LRP004	6.00	SPR	13.33	
	N102	LRP06	1.00	SPR	0.64	
	N102	LRP079	12.00	SPR	62.62	
	N1041	LRP079	14.30	SPR	9.32	
	N1041	LRP020	24.80	SPR	109.27	
	N1041	LRP044	6.00	SPR	28.48	
	N1041	LRP074	28.80	SPR	122.23	
	N1042	LRP020	8.00	SPR	18.71	
	N1042	LRP020	8.00	SPR	28.87	
	N1042	LRP020	36.00	SPR	7.52	
	N1042	LRP074	10.00	SPR	44.10	
	N1044	LRP074	3.90	SPR	13.94	
	N1044	LRP039	6.00	SPR	26.48	
	N1048	LRP049	6.00	SPR	26.48	
	N1052	LRP039	4.50	SPR	0.00	
	N1052	LRP079	11.20	SPR	11.52	
	N1053	LRP020	6.20	SPR	22.81	
	N1053	LRP039	4.70	SPR	20.73	
	N1053	LRP074	1.30	SPR	21.37	
	N1036	LRP009	11.50	SPR	4.49	
	N1036	LRP009	2.00	SPR	30.87	
	N1008	LRP009	18.20	SPR	9.49	

**Administrative Definition**  
 ■ District HQ  
 ● Upazila HQ  
 --- International Boundary  
 - - - District Boundary  
 ····· Upazila Boundary

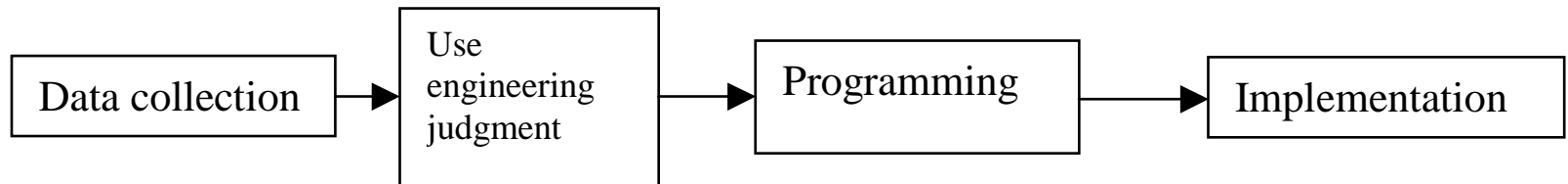
**Rank By Colour**  
 Critical (Red)  
 Priority (Blue)  
 Nil (White)  
 Ongoing (Green)  
 Poverty (Purple)

**Explanation of RAMS Code**  
 Category + Rank + Treatment  
 R = Road C = Critical  
 B = Bridge P = Priority  
 PC = Periodic Carpeting  
 PS = Periodic DBST  
 PO = Periodic Overlay  
 M = Rehabilitation  
 R = Reconstruction

Feature Type	No Work	Periodic						
		DBST	Carpeting	Overlay	Rehab	Improve	Reconst	New
Road								
Bridge								
Ferry								

Not: Shape colour signifies the Rank, this table shows as 'Priority'

# LGED-PMS:



**HDM-4 being implemented**



## **PMS of Other Road Agencies:**

- **PMS of other agencies are at initial stages.**
- **Economic decision-making tool (HDM-4) yet to be installed.**
- **Expertise exchange from the lead agency is encouraged.**

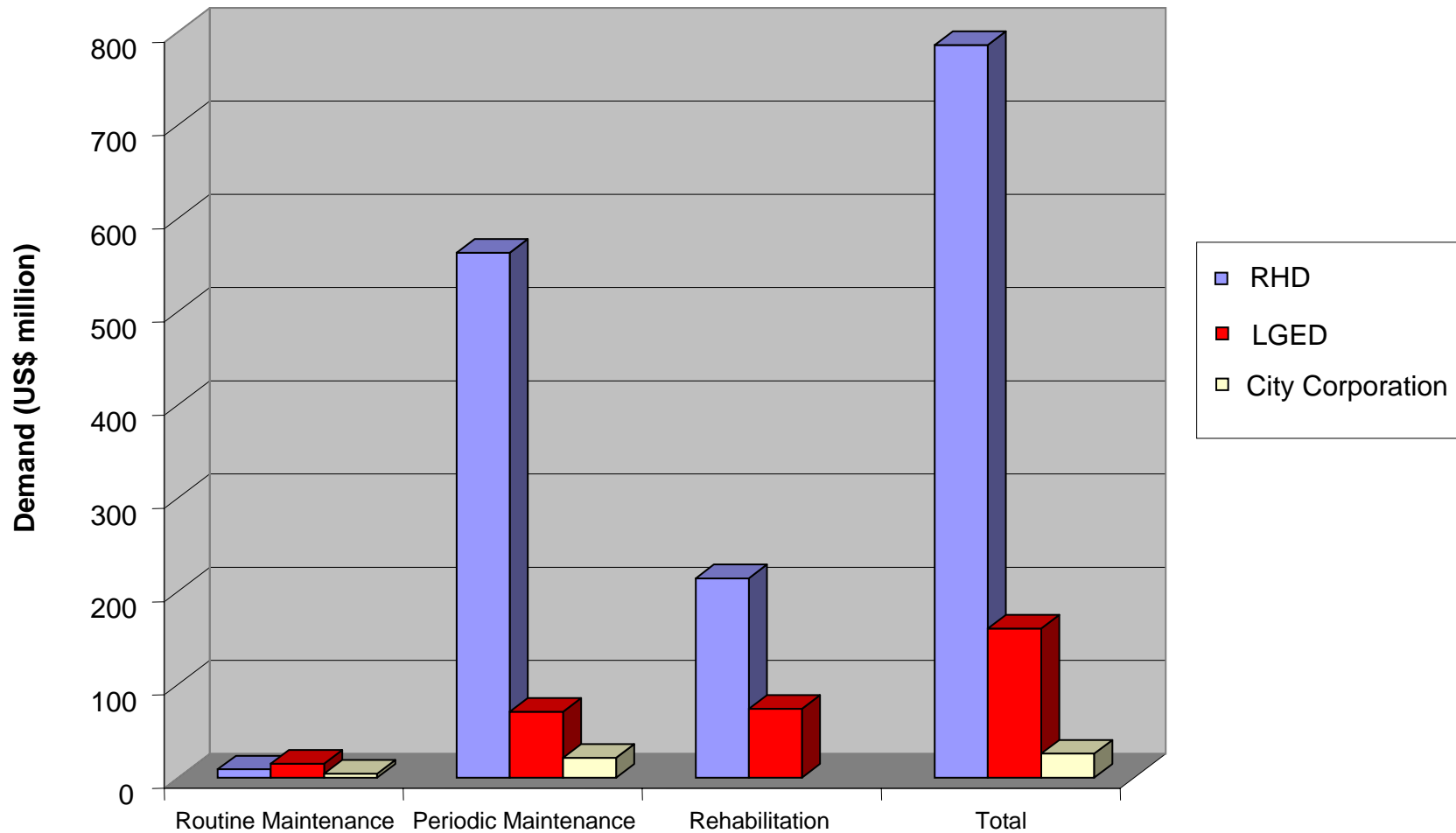


## Current Maintenance Scenario:

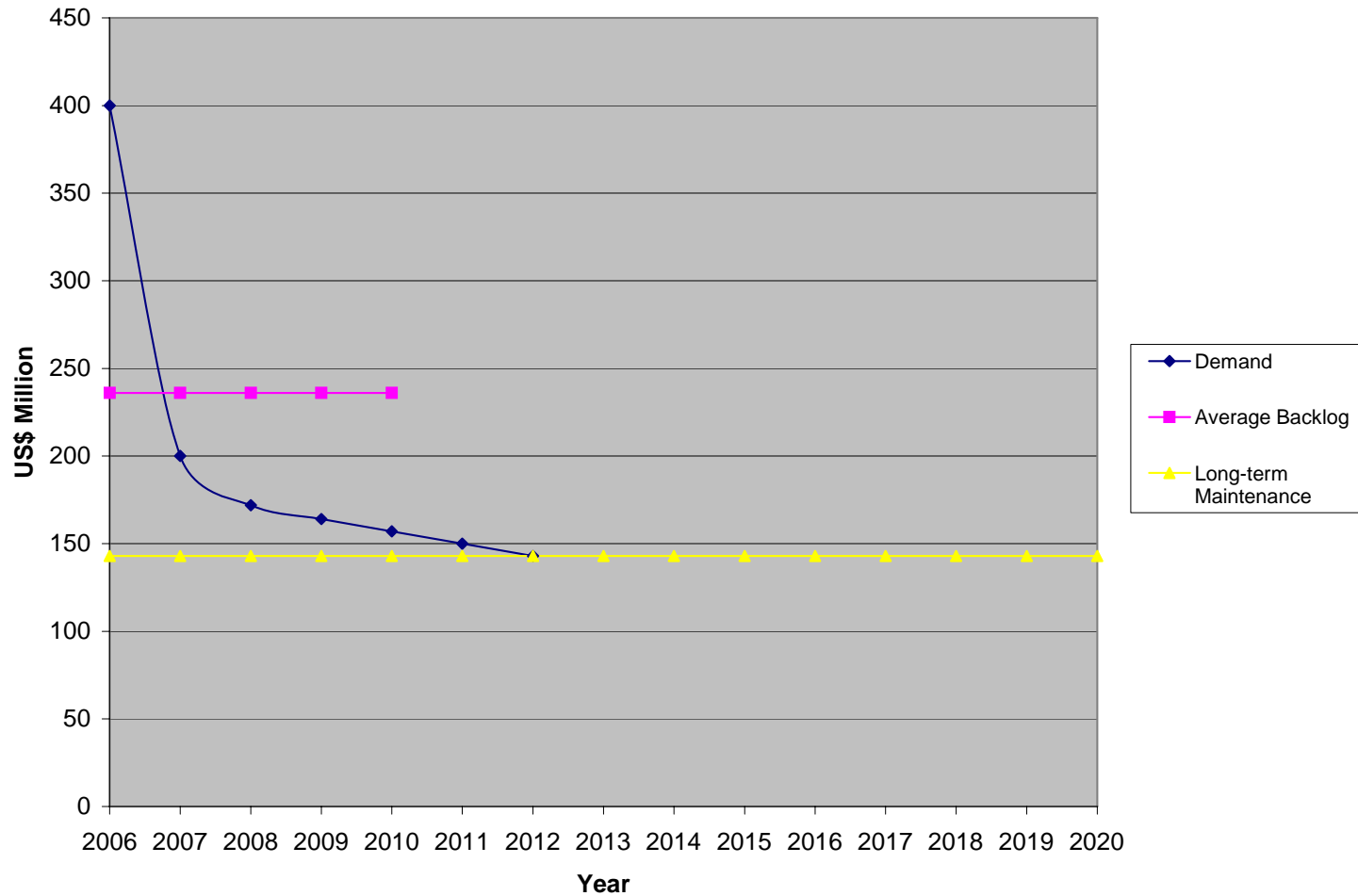
- **Total annual maintenance demand is about US\$ 215 million.**
- **Government funding is around 50%.**
- **Current backlog is US\$ 385 million.**



# Total Demand on Road Maintenance:

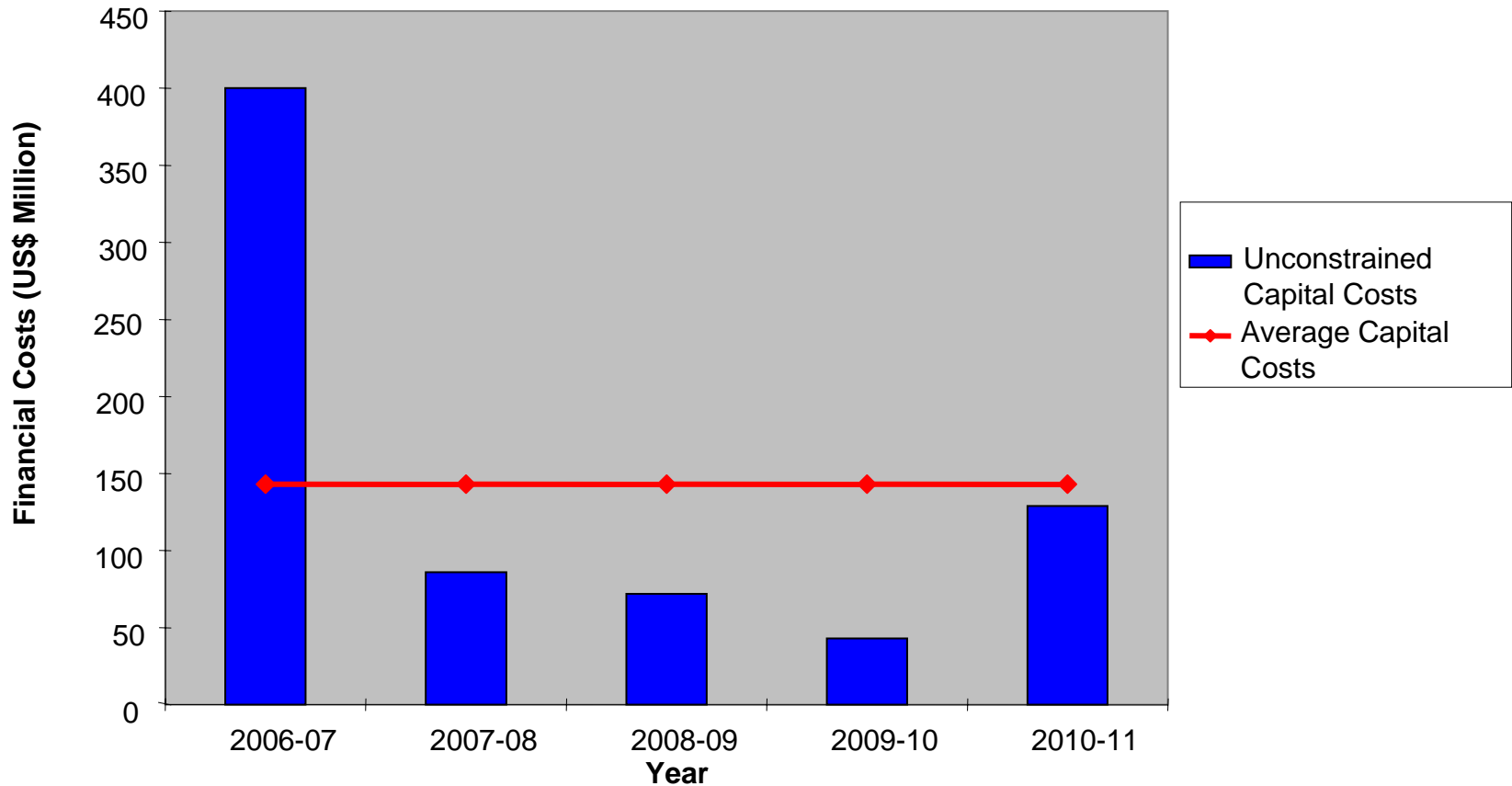


# RHD's Requirement:

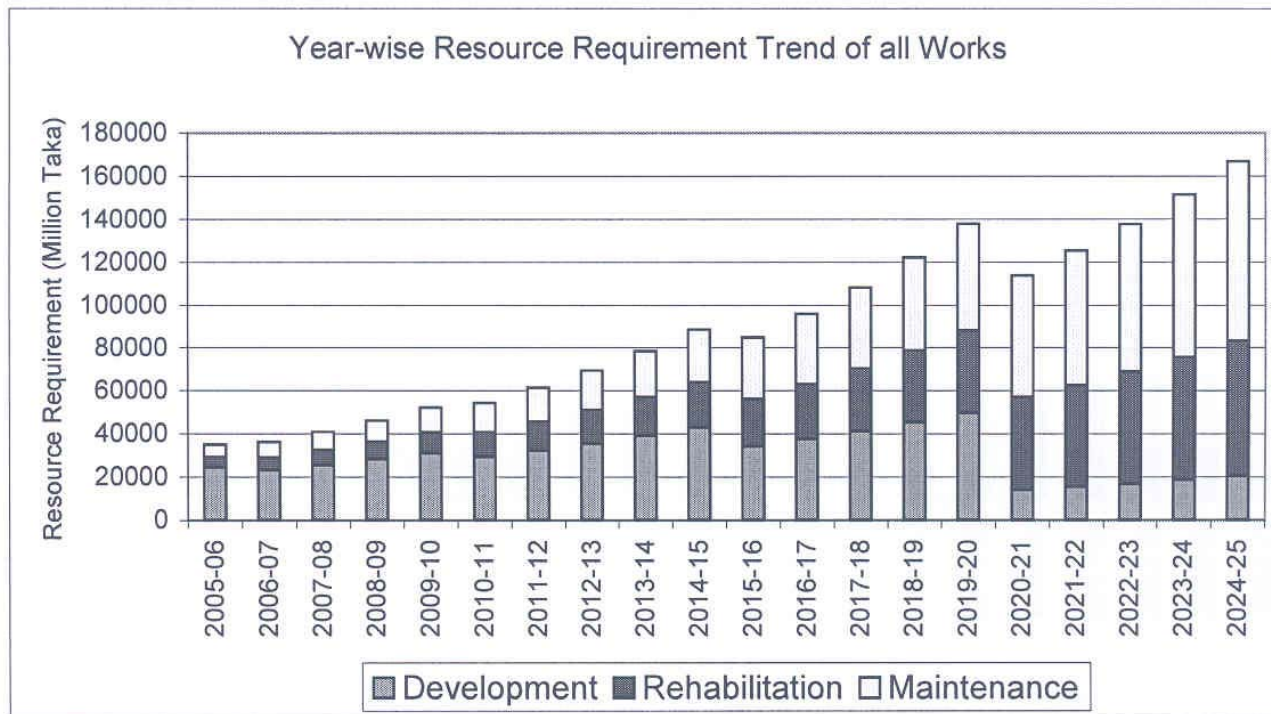


# RHD's Unconstrained Demand:

Unconstrained and Average Capital Costs



# LGED's Requirement:



# Optimum Annual Maintenance Expenditure:

Table: Estimated optimum maintenance expenditure in US\$ million (RFEO, 2006)

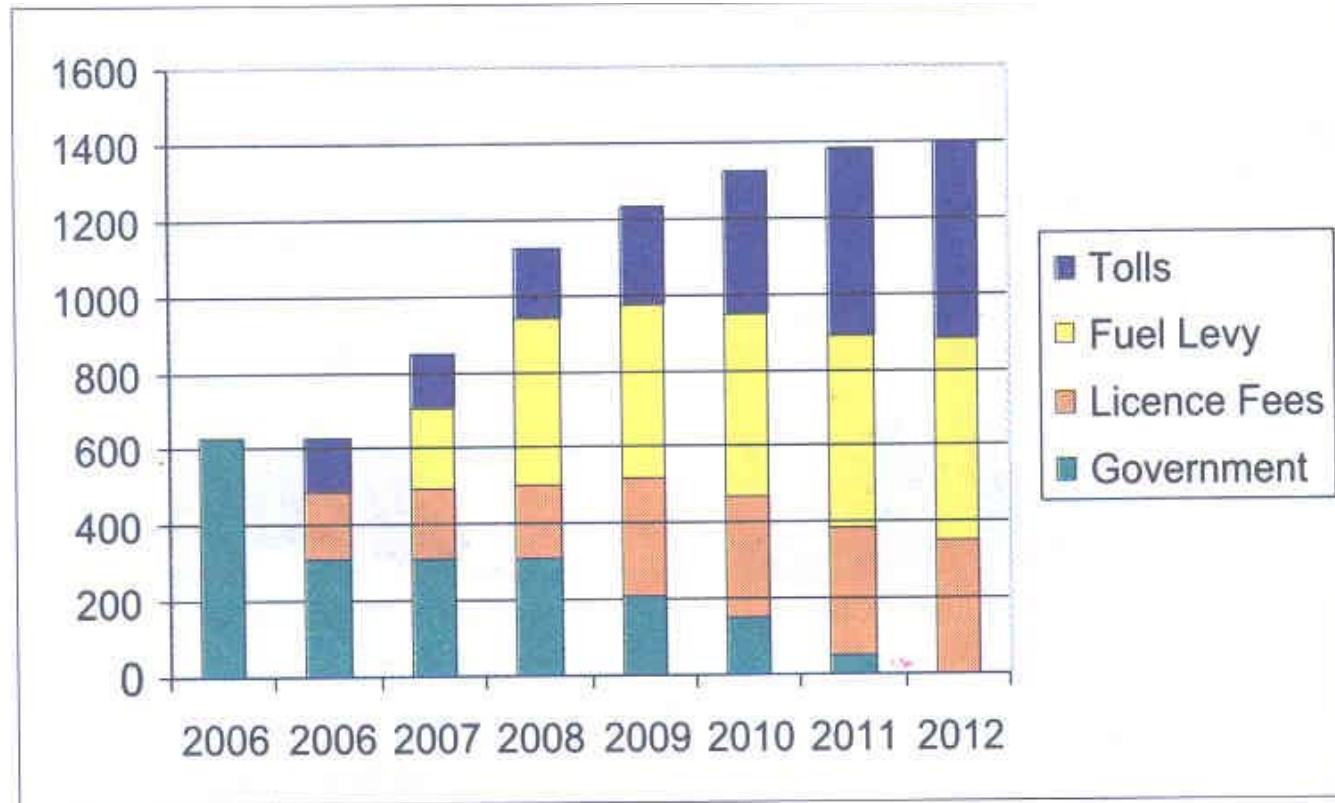
Agency name	Type of road	Routine maintenance	Periodic maintenance	Total demand	Percentage of demand (%)
RHD	National Highway	2.30	37.70	40.00	RHD requires 56% of the total demand.
	Regional Highway	1.54	18.46	20.00	
	Zilla Road	4.62	55.38	60.00	
LGED	Upzilla road	6.15	46.15	52.30	LGED requires 32% of the total demand.
	Union road	3.08	13.85	16.93	
City Corporation	City roads	4.46	21.38	25.84	City Corporations require 12% of the total demand.
Total		22.15	192.92	214.63	



## Road Fund:

- **Road Fund is planned as a Govt. policy**
- **Workshops on road fund show integration between the road users, transport agencies and political tiers supported by technical expertise**
- **Regional experience on Road Fund shows potential for road maintenance**

# Sources of Road Fund:





## Public Private Partnership (PPP):

- **PPP adopted as Govt. policy**
- **Saves time**
- **Optimize public administration costs**
- **Risk sharing is a big factor**
- **Concessionaires indemnity needed**



# Performance Based Maintenance (PBM)

- PBM contracts are being implemented in Low Volume Traffic roads
- Evaluation of performance (PBM contract) needs skilled handling by agencies
- Risk sharing and time frame are yet to be streamlined
- Regional experience in PBM contract administration to be taken in consideration

## Conclusions:

- Road asset management to be included in the national transport policy
- Road maintenance to be prioritised in national yearly budget policy
- Maintenance to be considered as business
- Road pricing to be done with regional, international and institutional experience
- Gradual shifting of development budget to preservation/maintenance
- Immediate functioning of Road Fund Board

Cont.



## Conclusions:

- **PPP to be encouraged and Govt. approval route shortened**
- **PBM to be adopted gradually**
- **Integration and expertise exchange amongst policy makers and road agencies**



**THANK YOU**