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Implementation of the Road Asset Management System in the Sindh province of Pakistan

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BACKGROUND

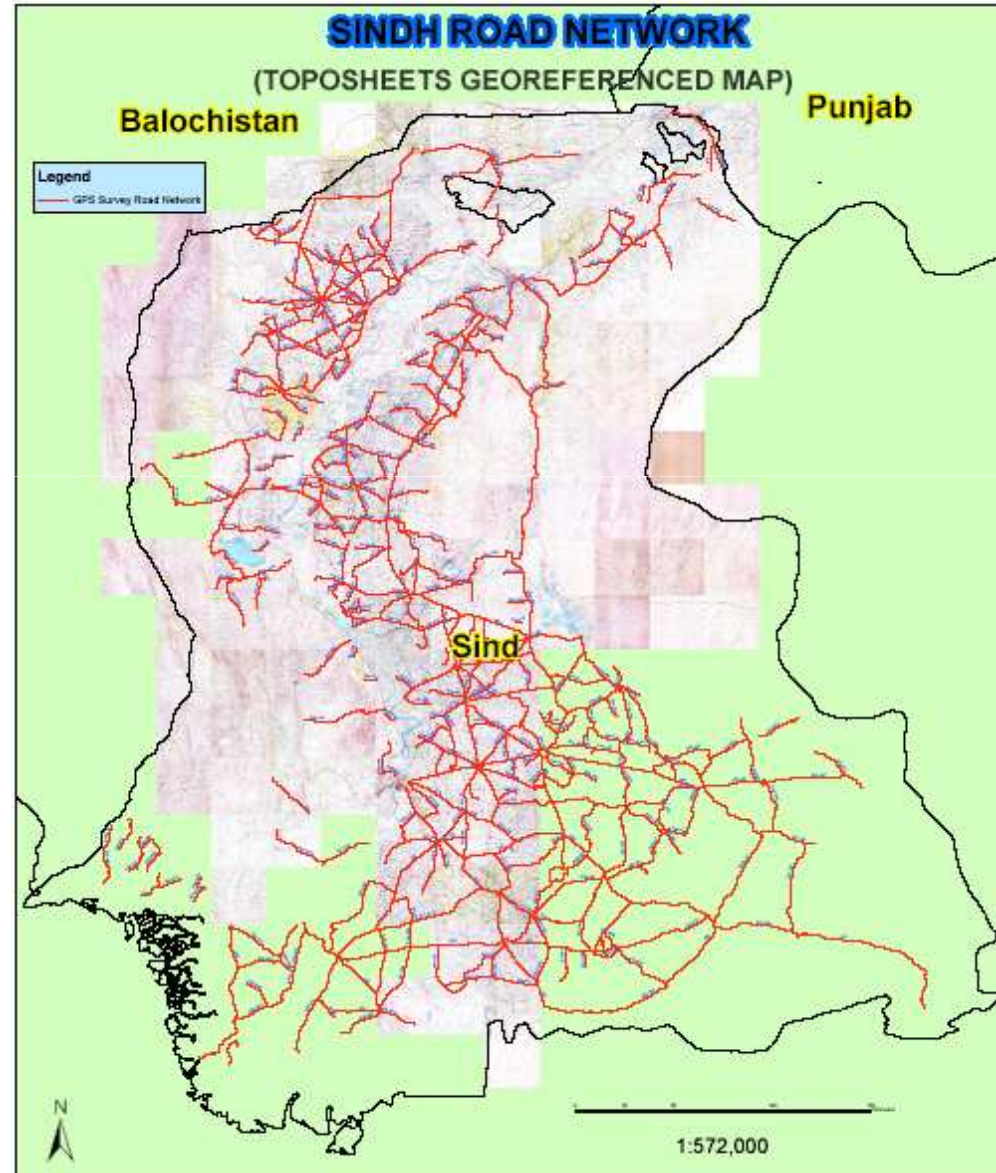
- Works and Services Department (WSD) of the Government of Sindh is responsible for over 11 000 kms of roads
- Indirectly overseeing 17 000 kms of roads
- Over 1200 bridges and 10 000 culverts



Sharing the road

16th World Meeting
International Road Federation

ROAD NETWORK





PROJECT SETUP

- In ADB funded project "Sindh Road Sector Development Programme" (2005-2009) one component was development of Road Assets Management System (RAMS)
- The overall objectives of were initiating institutional reforms, establishing efficient resource management systems, preserving road assets, increasing road safety, improving governance, community development and environmental management.



SUCCESS FACTORS OF RAMS

- A) Technology
- B) People
- C) Processes



INFORMATION SYSTEMS

1. Requirement Analysis
2. System Design
3. System Development
4. System Testing and Implementation
5. System Use
6. System Disposition

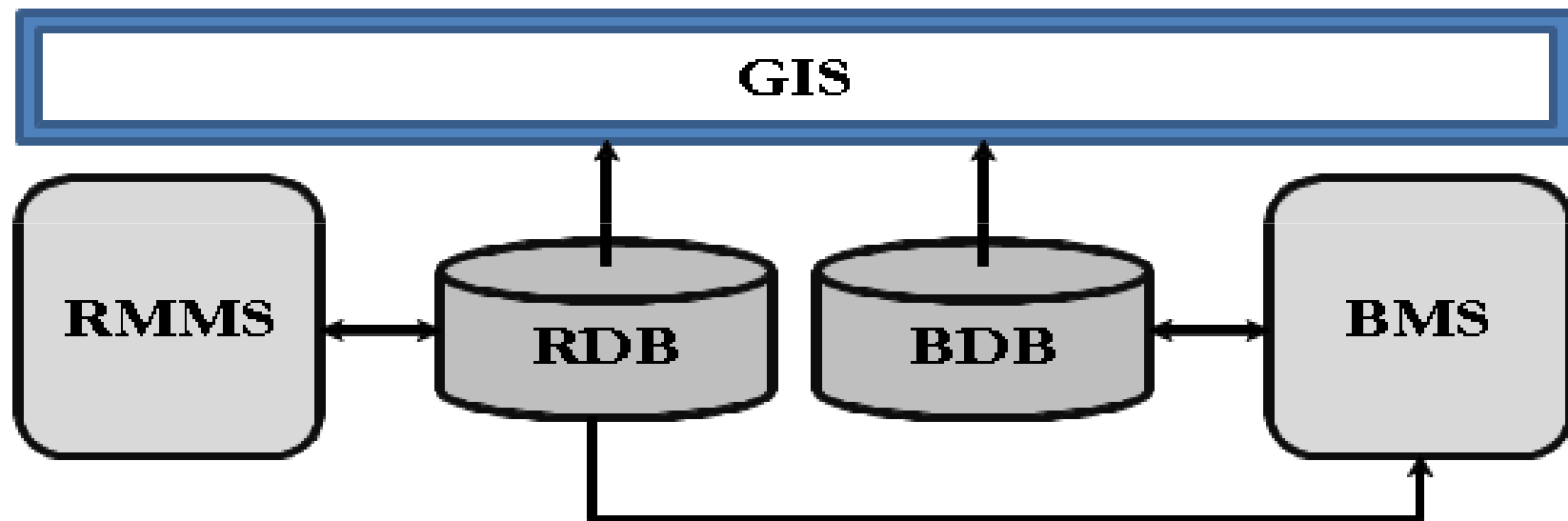
LEADING ROLES

	Technology	People	Processes
Requirement Analysis	A1	B1	C1
System Design	A2	B2	C2
System Development	A3	B3	C3
System Testing	A4	B4	C4
System Use	A5	B5	C5
	Client	Consultant	Both

1. REQUIREMENT ANALYSIS

- The requirements from the client's side were to establish a RMMS being as close to the previous system as possible, a separate Bridge Management System (BMS) due to increased data under collection and a proper GIS. The idea was to keep everything as simple as possible due to restricted resources and future financing

2. SYSTEM DESIGN





3. SYSTEM DEVELOPMENT

The development was done in 3 stages within 1 year so that each time the current version was installed on the clients' computer. The team included a Bridge Expert, GIS Expert, Road Maintenance Expert and Road Asset Management System Expert and they contributed with an input between 1 to 3 months. Crucial issue in this stage was a close cooperation with the client and taking flexibly into consideration the arising needs.

4. SYSTEM TESTING AND IMPLEMENTATION

- System testing occurred in several steps. The first testing is done by the developers during the development so that the systems run and they produce the desired outcome.
- The final systems were installed and training was given to the end users at the end of the whole institutional development project.



Sharing the road



SYSTEMS

PPRMS 2.0 - [RoadBrowser]

File Database Reports Parameters **Economic Analysis**

New Delete Condition Roughne

Enter yearly budgets
Open an existing analysis
Create new analysis
Run multi-year analysis

Features Inventory Links

Provincial Highway

S01	S01	S02	S04	S05
S06	S07	S09	S11	S13
S15	S18	S19		
S20	S25	S28		
S21				
S23				
S25				
S28				
S31				
S34				
S35				
S46				

Bridge Management System

Database Import Indexes

Districts	Roads	Structure types	Structures	Structure details
BADIN	550-034	Bridges	S85-202-010BR	ID and location General data Main types Main measures Misc Joining road
DADU	550-037	Culverts	S85-202-020BR	Bridge ID: S85-202-010BR
GHOTKI	550-038		S85-202-030BR	Inspection date: 3.12.2007
HYDERABAD	550-040		S85-202-030BR	District: Thatta
JACOBABAD	550-041		S85-202-040BR	Road: S85-202
KARACHI	550-042			Maintenance unit: Thatta
KHAIRPUR	550-043			Structure type:
LARKANA	550-047			Bridge name: Al-Habb
MIRPURKHAS	550-050			River name:
NAWABSHAH	550-053			Name of the bridge place:
NOVSHEHRU FEROZE	550-056			Notable object nearby: Al-Habb Colony
SANGHAR	550-058			Distance from section start: 0.3
SHIKARPUR	550-060			Latitude: 42.392057
SUKKUR	550-061			Longitude: 27.34668
THAR	550-063			Notes:
THATTA	550-067			
UMERKOT	550-069			
	550-071			
	550-075			
	550-082			
	550-091			
	550-100			
	550-101			
	550-103			
	550-200			
	550-210			
	550-245			
	550-300			
	550-305			
	S85			
	S85-202			
	S85-203			
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	S85-208			
	S85-209			

Create report Create report Create report Save changes Add structure Delete structure Google Earth



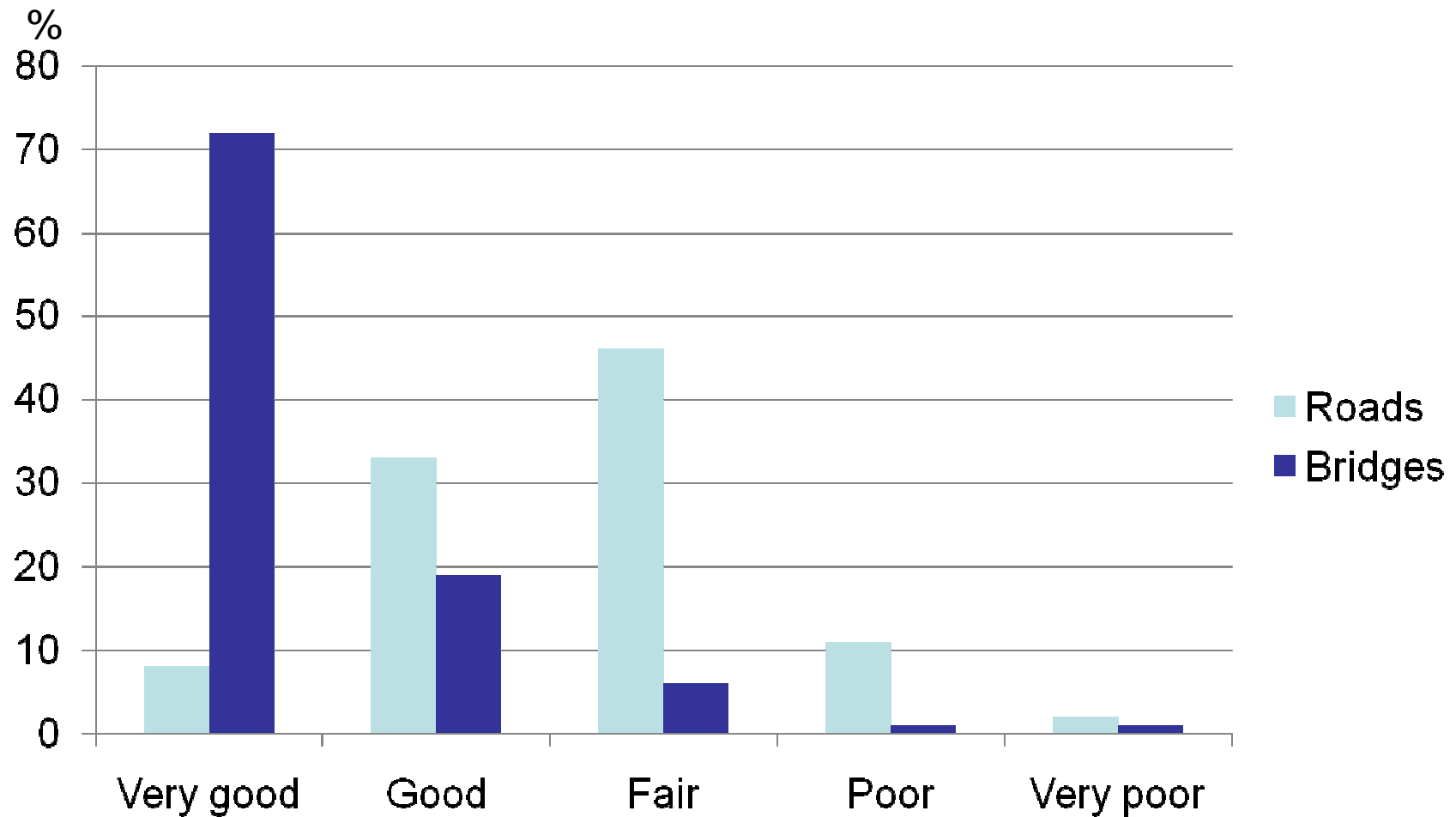
5. SYSTEM USE (1)

- During the testing and implementation the systems were used for strategic analysis and maintenance programming of a 5-year maintenance plan for 9,850 km of roads, 1,237 bridges and 10,467 culverts. The data was collected from December 2007 to June 2008 and this activity was entirely outsourced to the private sector.

5. SYSTEM USE (2)

- It was noticed that around 2 % of the surveyed roads were in very poor, 11 % in poor, 46 % in fair, 33 % in good and 8 % in very good condition, whilst the average IRI was 7.3 for the surveyed road network of 7 479 km. Bridges were generally in better condition as 1 % of the bridges were in very poor, 1 in poor, 6 % in fair, 19 % in good and 72 % in very good condition and 1 % were not evaluated.

INFRA CONDITION





5. SYSTEM USE (3)

According to the strategic analysis based on IRI value around 22 Billion Pakistani Rupees (360 Million US Dollars) is required to get the average IRI to 4.5 by the year 2015. For the 5-year maintenance plan around 6.3 Billion Pakistani Rupees should be invested in road maintenance and 1.5 Billion Pakistani Rupees in bridge and culvert maintenance. The surveyed network, maintenance plan and condition after maintenance were presented on maps produced by the GIS.

LESSONS LEARNT (TECHNOLOGY)

- System testing takes long => project scheduling
- Survey data quality problems => training and clear instructions
- Simple is often more practical and off-the-shelf packages are not always the right solution



LESSONS LEARNT (PEOPLE)

- Inter-disciplinary team required
- Implementation quality and speed is greatly improved when the client already has skilled people committed to road asset management



LESSONS LEARNT (PROCESS)

- No sufficient funds for maintenance works
- Lack of commitment from Provincial Government to sponsor road related data collection and maintenance activities
- Lack of private sector involvement
- Lack of coordination
- Frequent transfers and postings of staff
- Road maintenance is not sexy enough