

**PIARC Seminar on Road Asset Management
19-21 March 2008, Chandigarh**

**Maintenance Management
Tools for Rural Roads**

Presentation by:

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Director (Roads and Highways)

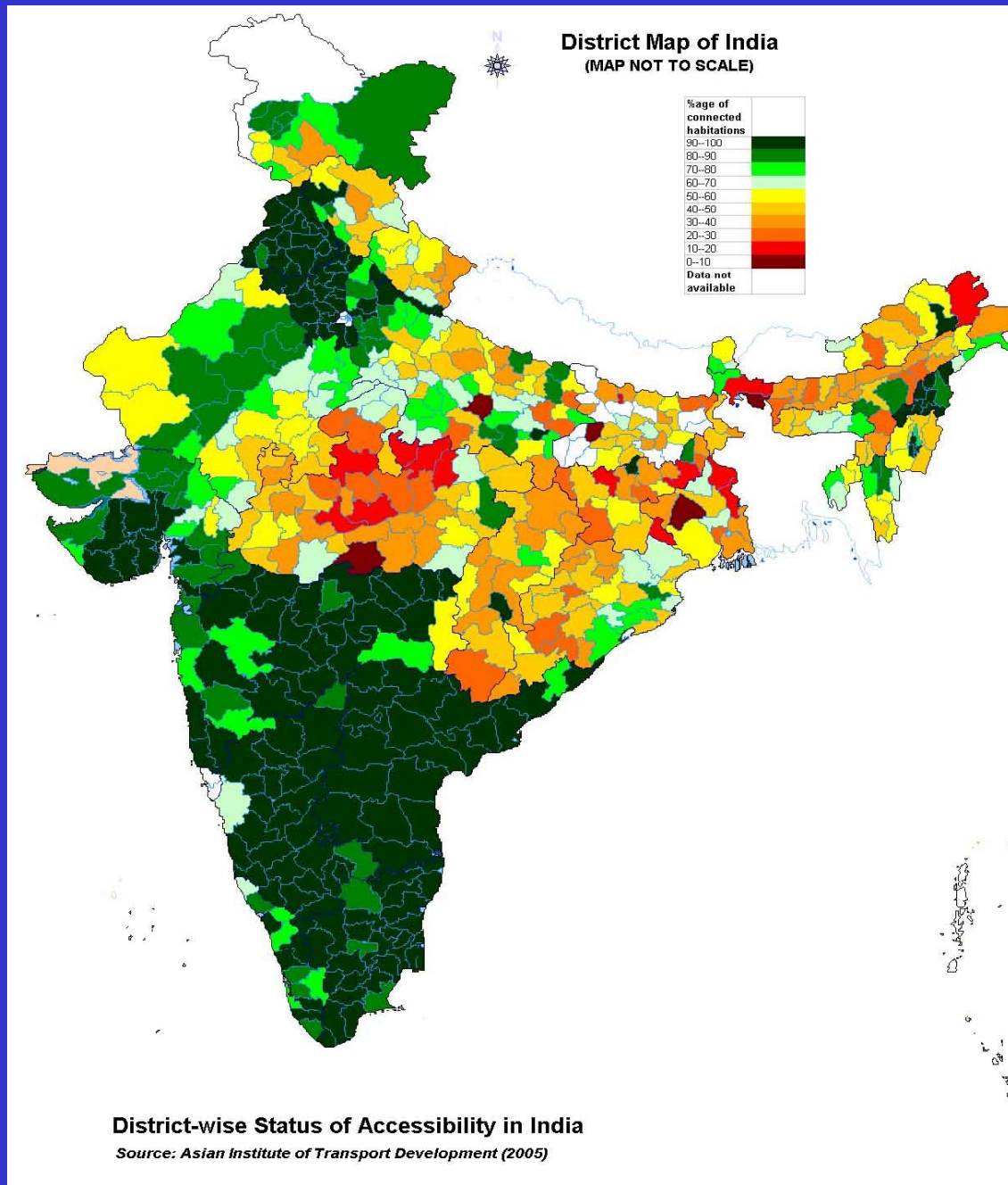
Asian Institute of Transport Development

New Delhi

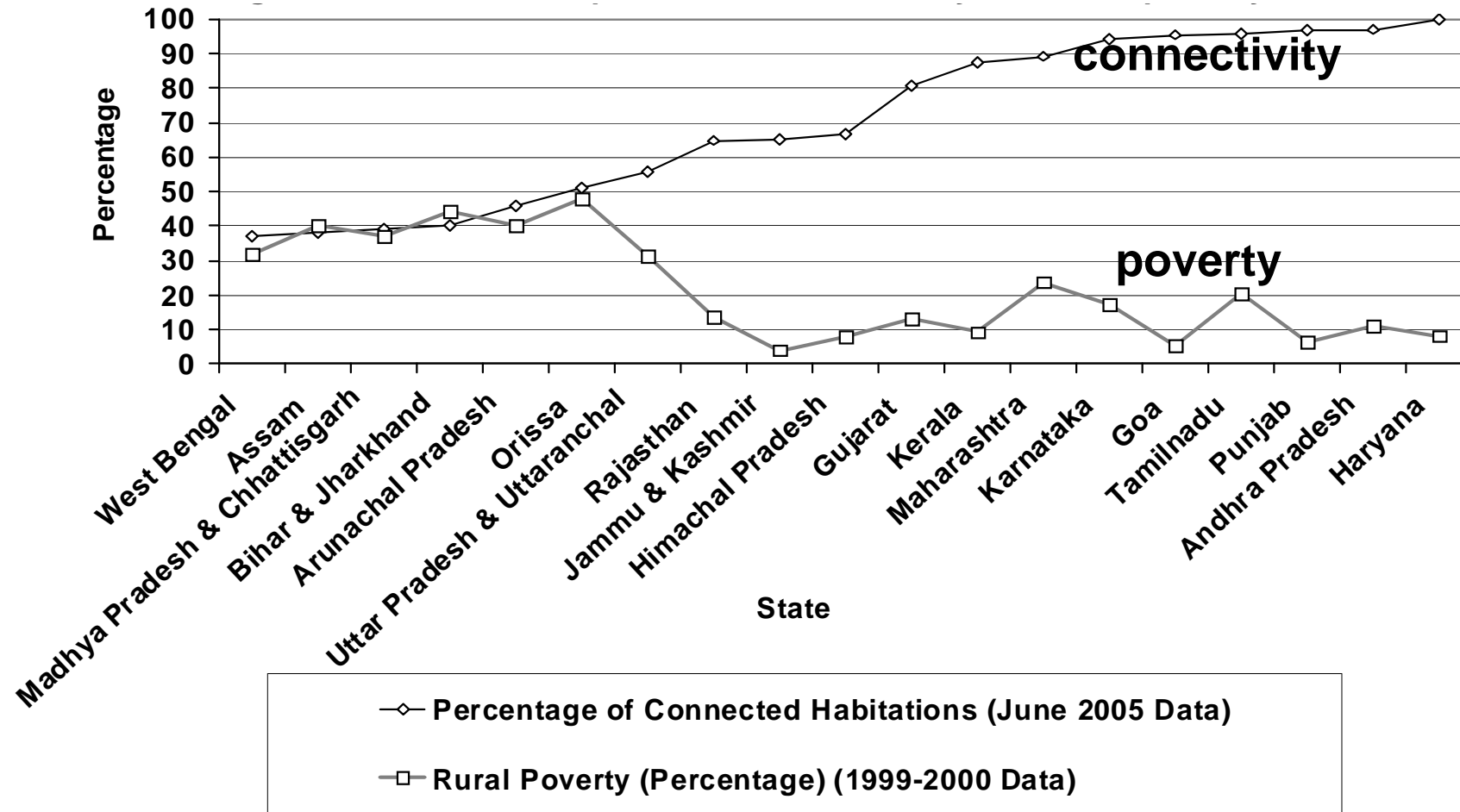
Scenario in India

- Existing Road Network: 3.3 million km
of which rural roads: 2.65 million km (80%)
- In 1950 Average Distance: 10 km from a village
- In 2000 Average Distance: 2 km from a village

But, wide variation across states/districts



Entry Point for Poverty Alleviation



PMGSY

- **Launch :** Year 2000
- **Target :** All-weather Access to Habitations
Population 500+ (250+ hills, tribal and desert areas)
- **Scale and :** Investments Rs. 133,000 crore size (\$33 billion)
New construction : 375000 km
Upgrading : 375000 km
- **Priority** : Bharat Nirman
Habitations 1000+ (500+ hill, tribal and desert areas)
: Annual Allocations Rs. 12000 crore (\$3 billion) and likely to be raised
: Low connectivity states for new construction
: High connectivity states for improvements

Challenge

- **New connectivity (Antyodaya)**
- **Improvement of existing roads**
- **Preservation of assets (Rs. 200,000 crore)**

Impact of Poor Maintenance

- Increase in VOC (Vehicle Operating Cost)
- Increase in journey time
- Rehabilitation costs 3 to 4 times
- Poor hit badly
- Poor image of road agency, state, nation

Assets Assessment

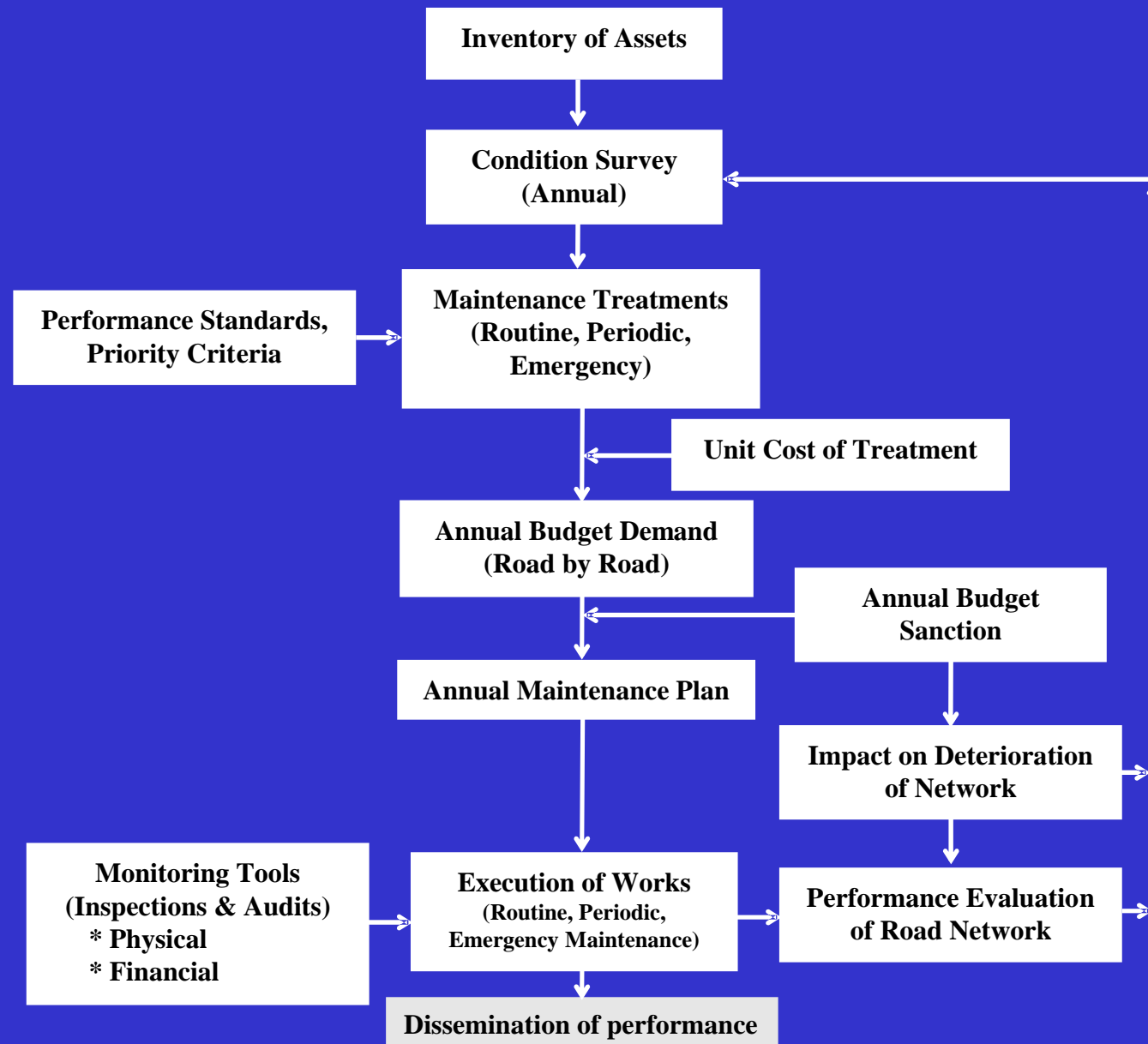
- **Asset Value** : Rs. 200,000 crore (\$50 billion)
- **Condition of Network** : 80% poor
10% fair
10% good
- **Annual Loss** : Rs. 10,000 crore (\$2.5 billion)
40,000 km eroded annually

Can we afford to lose

Maintenance Management Tools for Rural Roads: Attributes

- Simple (not complex), start small and gradually build up
- Easy to collect data – inventory
– condition
- Ability to predict condition – simple and tested prediction models
- Linking condition with
 - Importance of road
 - Expected performance standards
 - Maintenance Intervention/treatment
- Put up need based demand
- Annual programme based on available budget
- Impact of gap between funds needed and available

Maintenance Management for Rural Roads



Case Study by ILO (Madhya Pradesh)

- **Road Inventory (visual)**
 - **Accessibility**
 - **Maintainability**
- **Road Condition (visual)**
 - **Pavement (pot holes, camber)**
 - **Drainage (side drains, culverts)**
- **Ranking of Maintainable Roads**
- **Identifying Roads to be made Maintainable**

Data Effort and Time

- Two teams of 2 persons each
- Output 10 km per day by one team
- Maximum of 2 months for the country/state
(Assuming one JE is available for 50 percent time for this activity).

ROAD INVENTORY		DISTRICT: _____	BLOCK: _____																
ROAD CLASS + NO.: _____		ROAD NAME (from - to): _____																	
ROAD LENGTH: _____ km		SECTION NO.: _____	SECTION LENGTH: _____ km																
ACCESSIBILITY LEVEL: <input type="checkbox"/> No <input type="checkbox"/> Partial <input type="checkbox"/> Basic <input type="checkbox"/> Full MAINTENANCE LEVEL: <input type="checkbox"/> Unmaintainable <input type="checkbox"/> Partially Maintainable <input type="checkbox"/> Maintainable		TOTAL POPULATION SERVED BY ROAD: DS: <input type="text"/> IS: <input type="text"/>																	
SURFACE TYPE: <input type="checkbox"/> Bitumen <input type="checkbox"/> Gravel <input type="checkbox"/> Water Bound Macadam <input type="checkbox"/> Earth		STRIP MAP: 																	
PRINCIPAL SUBSOIL TYPE: <input type="checkbox"/> Friable Clay <input type="checkbox"/> Stony / Natural Gravel <input type="checkbox"/> Black Cotton / Expansive Clay <input type="checkbox"/> <input type="checkbox"/> Sandy Soil <input type="checkbox"/>																			
GRADIENT: % OF SECTION LENGTH <input type="text"/> % Flat/Undulating: 0 - 3% <input type="text"/> % Medium: 3 - 6% <input type="text"/> % Hilly: > 6% 100 % TOTAL																			
AVERAGE FORMATION WIDTH: 																			
AVERAGE DAILY TRAFFIC: <input type="checkbox"/> 0 - 25 <input type="checkbox"/> 51 - 100 <input type="checkbox"/> 200 - 500 <input type="checkbox"/> 26 - 50 <input type="checkbox"/> 100 - 200 <input type="checkbox"/> > 500																			
Symbols of Strip Map: <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"></td> <td>Village</td> <td style="text-align: center;"><input type="checkbox"/> A</td> <td>Admin. Centre</td> </tr> <tr> <td style="text-align: center;"></td> <td>Cross Drainage</td> <td style="text-align: center;"><input type="checkbox"/> M</td> <td>Market</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/> S</td> <td>School</td> <td style="text-align: center;"><input type="checkbox"/> R/H</td> <td>Religious or Heritage Monument</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/> HC</td> <td>Health Centre</td> <td style="text-align: center;"></td> <td>Quarry: S = Stone G = Gravel</td> </tr> </table>			Village	<input type="checkbox"/> A	Admin. Centre		Cross Drainage	<input type="checkbox"/> M	Market	<input type="checkbox"/> S	School	<input type="checkbox"/> R/H	Religious or Heritage Monument	<input type="checkbox"/> HC	Health Centre		Quarry: S = Stone G = Gravel	Inventory recorded by: Name: _____ Signature: _____ Date: _____	
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Ranking of maintainable roads by population served in Sihora Block

Road Status	PMGSY No	Road Class + Number	Road Name (from- to)	Road length (km)	Direct pop. served	Indirect pop. served	Direct pop. per km	Total pop. per km	Surface Type
TRS		TRS-08	Mohatara to NH-7	0.30	813	0	2710	2710	WBM
TRS		TRS-07	Nunjha to Majhagwan Rd.	0.40	778	0	1945	1945	WBM
PL	L/060	TRS-11	NH-7 TO Dharampura	2.00	2063	0	1032	1032	WBM
VR		VR-27	PWD Road Tikariya to Ranital	2.50	2274	0	910	910	WBM
PC	L-053	ODR(10)	Agaria to Barne Tiraha	15.70	10771	0	686	686	BT
PL	L-067	ODR (09)	Ghat Simariya to Ramkhiriya	5.75	3757	0	653	653	WBM

Asset Maintenance Strategy

- **Routine maintenance of roads which are in good and maintainable condition.**
- **Routine and periodic maintenance of roads which are in fair condition.**
- **Removing backlog of maintenance including rehabilitation of existing roads which are in poor condition. Thereafter, ensure routine maintenance of such rehabilitated roads and timely periodic maintenance.**
- **Ensure financial and technical audits.**

Government Commitment Needed for Maintenance Management Tools

- **Tools will improve visibility of funds spent**
- **Tools will generate confidence in the mind of fund allocation authority**
- **Road agencies will benefit by way of better image**
- **Users will get sustained benefits of accessibility**
- **Tools can be refined with experience and feedback.**

Thank You
for resolving to manage rural
road assets as it helps to
preserve them and in the process
enhances our image in the eyes
of the public.