

Design and Appraisal of Rural Transport Infrastructure

Based on World Bank Technical Paper no.496

PIARC International Seminar on Rural Transport
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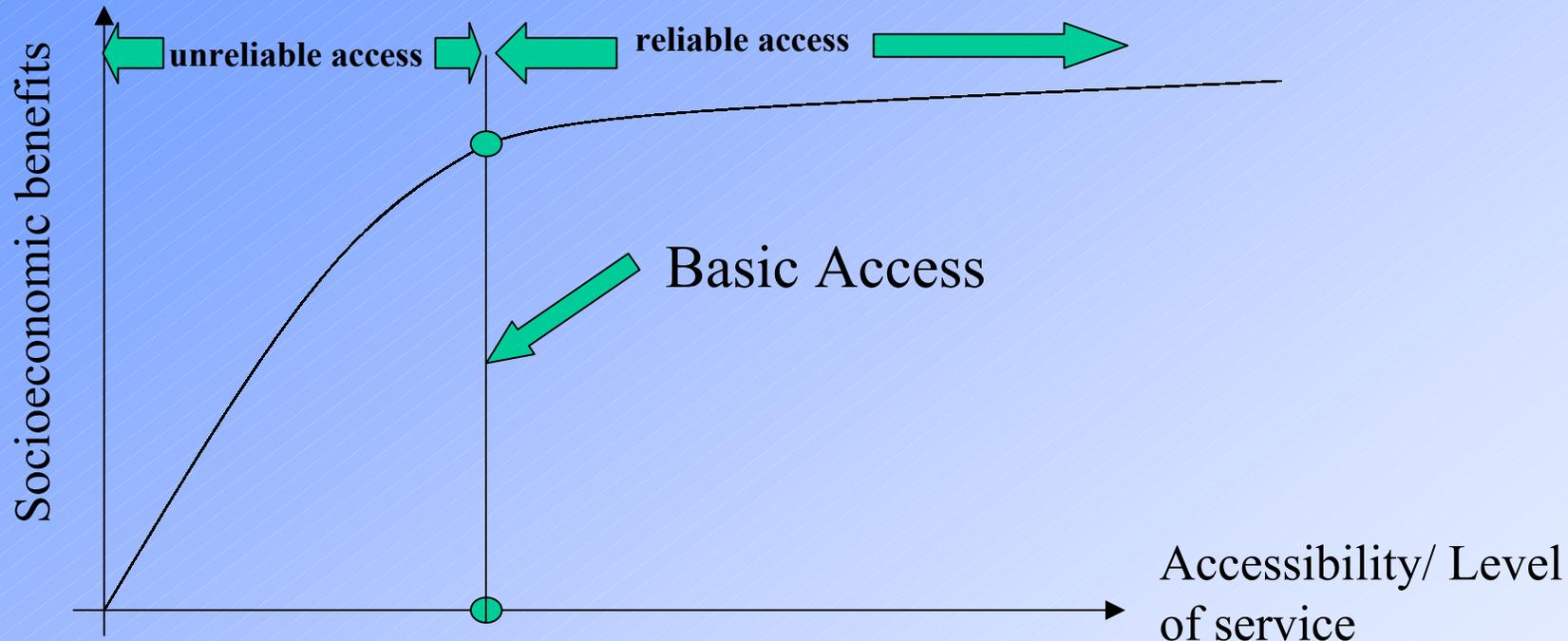
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Paper Series on Rural Transport published or planned by World Bank

No	Title	Status	Authors
1	Options for the Managing and Financing of Rural Transport Infrastructure	Published in 1998 as WB Technical Paper no. 411	Malmberg-Calvo
2	Design and Appraisal of Rural Transport Infrastructure	Published in 2001 as WB Technical Paper no. 496	Lebo, Schelling
3	Improving Rural Mobility	Being published	Starkey, Ellis, Hine, Ternell
4	Developing Rural Transport Policies and Strategies	Draft stage, planned to be published in 2003	Banjo, Robertson
5	Assessing Socio-economic Impact of Rural Roads and Transport	Draft stage, planned to be published in 2003	Grootaert

The Basic Access Concept

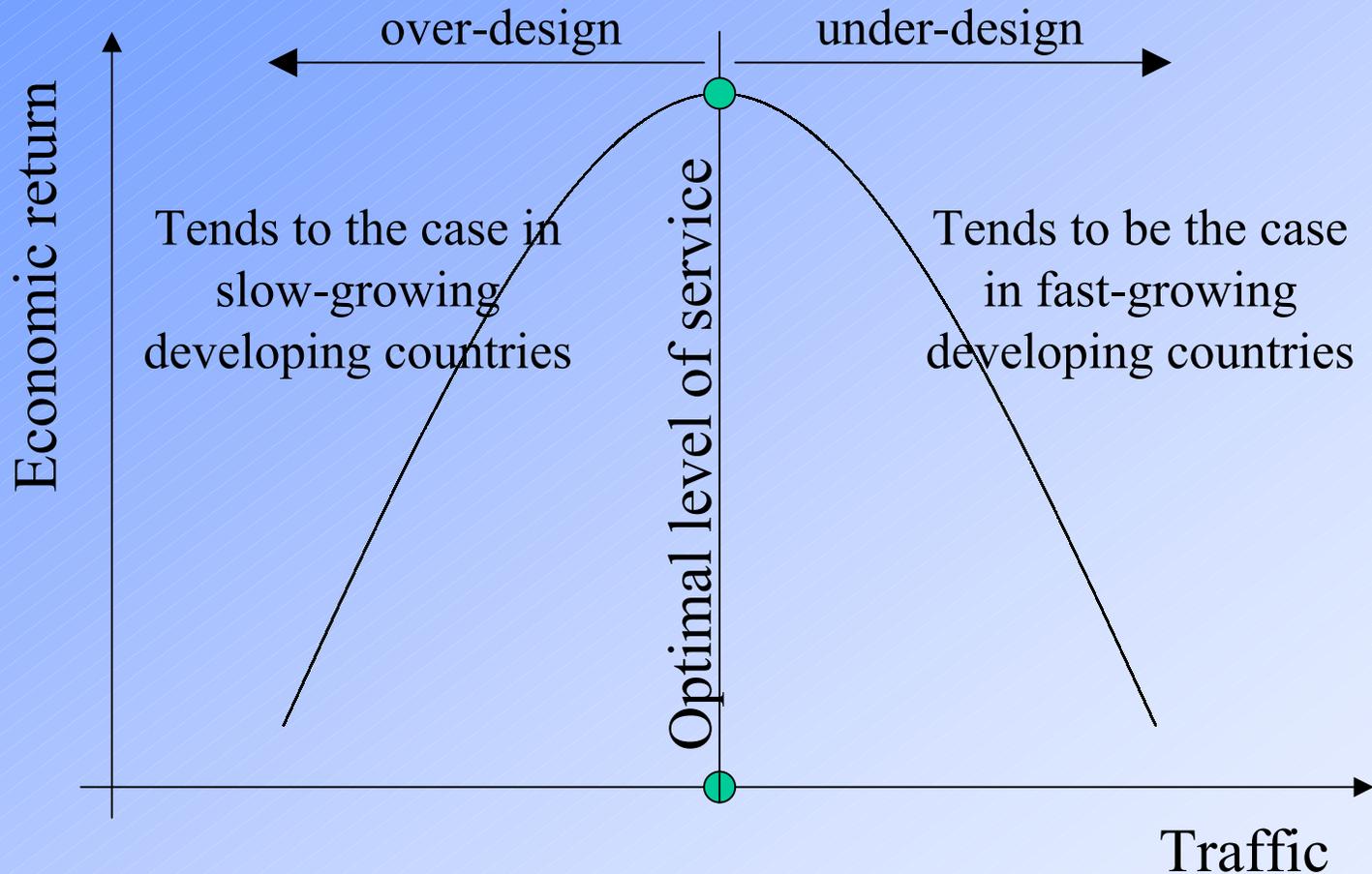


- Basic Access means reliable access at least cost
- Basic Access should be considered a human right
- A basic access intervention is the least life-cycle cost investment for ensuring reliable all-season accessibility for the prevailing means of transport
- All roads with less than 50 vehicles per day should be built at least to basic access standard

Basic Access Standard

- Basic Access must be defined for each country individually (in the Rural Transport Policy of the country)
- Depends on wealth, culture, and geography
- Suggested definition for LDCs:
 - Basic Access is achieved if reliable access is available for the prevailing motorized means of transport within 1 kilometer of household. Reliable access means all year round access with exception of limited periods during inclement weather
- Basic Access roads in most cases are single-lane, spot improved earth roads, provided with low cost drainage structures (such as fords)
- Costs can vary greatly depending mainly on terrain: from, say, \$5000/km to \$100,000/km
- Motorized basic access, however, is often not affordable for rural populations in poor countries. In those cases, provision of basic access could mean improvement of the access for non-motorized means of transport

The Basic Access Approach



Roads need to be designed to the correct service level related to traffic and then gradually adjusted with growing traffic

Planning and Selection of Rural Transport Infrastructure Interventions

- The Planning Process
 - Must be top-down and bottom-up iteratively
 - But must be centered on the “owner” of the infrastructure
 - Most of all, it must be participative and transparent
 - Selection of stakeholders for the participatory process is crucial
 - Economic selection criteria must be simple and transparent to allow for participation
 - In the planning process other than just economic criteria might need to be considered
- Tools for the Planning Process
 - Screening and ranking procedures
 - Maps

Planning and Selection of Rural Transport Infrastructure Interventions (2)

- Selection consists of two steps
 - Screening
 - E.g. selection of project area based on poverty criteria, or by eliminating low priority links
 - Ranking
 - Recommended ranking method for basic access roads is based on a cost effectiveness approach:

$$\text{Cost – effectiveness indicator of link} = \frac{\text{Cost of upgrading of link to basic access standard}}{\text{Population served by link}}$$

Planning and Selection of Rural Transport Infrastructure Interventions (3)

- Why cost-effectiveness (and not cost-benefit analysis)?
 - At traffic levels < 50 vpd the traditional economic tools (e.g. HDM) don't work
 - Producer surplus method often leads to unrealistic results
 - Emphasis is increasingly on social benefits of roads which are difficult to quantify
 - Method has been traditionally applied for other rural infrastructure (wells, health centers) but not for roads

Examples

- Andhra Pradesh Rural Roads Project
 - Three districts selected based on poverty criteria (screening)
 - Screening based on redundancy criteria (only one all-season link per village) with the help of District Transport Master Plans: core network of 9000 km
 - Ranking based on cost-effectiveness (700 links): 3000 km selected for upgrading to basic access standard
 - Out of which 1000 km were selected for upgrading to bituminized standard (with the help of a simple spreadsheet cost-benefit analysis: threshold about 150 vpd)

Examples (cont.)

- Vietnam Rural Transport Project
 - Here the above described cost-effectiveness approach was enhanced by giving a poor person a higher “weight” than a non-poor (requires reliable and detailed poverty data)
- Bhutan Roads Project
 - Here the cost-effectiveness approach was enhanced with a cost-benefit analysis on a selected link, which included social benefits (such as educational and health benefits)

Examples (cont.)

- Madagascar Rural Transport Project
 - Screening was applied to select about 8,500 km out of 21,000 of provincial roads based on connectivity, agricultural and demographic criteria
 - The 8,500 km were ranked (in about 150 links) based on least-cost upgrading to basic access standard (based on preliminary engineering designs) per population served
 - Actual selection of the first-year intervention program was made at provincial workshops with all major stakeholders participating
 - Exercise is planned to be repeated annually and should lead eventually to a province based regional planning process using all kinds of spatial data using GIS

Thank you