

Rural Transport Training Materials

Module 5:

Social and Environmental Issues

Rural transport survey techniques

Session 5.5

Part 1

Presentation 5.5a



The World Bank



DFID Department for
International
Development



theIDLgroup 

The Training Modules

Module 1. Policies and Strategies

Module 2. Planning, Design, Appraisal and Implementation

Module 3. Management and Financing

Module 4. Rural Mobility

This Module

Module 5. Social and Environmental Issues

Module 5: Social and Environmental Issues

Session 5.1 Social benefits of rural transport

Session 5.2 Women and rural transport in Africa and Asia

Session 5.3 Transport and sustainable rural livelihoods

Session 5.4 Environmental impact assessment and management

This session

Session 5.5 Concepts of rural transport surveys

Session 5.6 Role play on rural transport

1. Introduction

Learning Objectives

This session enables participants to:

- ③ Explore the range of participatory and traditional survey techniques for the transport sector
- ③ Assess the complementary nature of different survey techniques and the need to employ a range of survey types

Session Overview

- © Background
- © Supply side surveys
- © Demand side surveys

2. Background

🌀 Surveys ask

- how well current transport functions
- transport development opportunities
- future demand for transport

🌀 Surveys both

- quantitative
- qualitative

Two main categories

Supply surveys

Demand surveys



Credit: TRL Limited

Supply & demand surveys applicable to all modes of transport

- © Freight carriage
- © Passenger carriage
- © Motorised, human and animal powered vehicles

Supply surveys

③ Describe nature of transport system

- scale
- productivity
- bottlenecks
- scope for development

③ Generally **quantitative**

- establishing performance indicators
- growth factors
- costs
- etc.

© Quantitative data used in

- analytical models
- databases
- comparative analyses
- monitoring over time

© Qualitative data

- institutional structures
- quality of transport provision

Demand surveys

⊙ Describe

- way transport system is used
- user satisfaction
- user transport needs and preferences

⊙ More **qualitative** than supply side surveys

⊙ Data is therefore...

- less 'absolute'
- more locally specific
- difficult to compare

3. Supply-side surveys

- © What supply survey techniques are available?
- © Two categories of supply survey

Road surveys

Road user surveys

Road surveys

Inventories

Purpose: *To confirm road agency records*

- esp. local paths/tracks

Methods: Record from vehicle or by foot

- road widths & lengths
- structures (bridges, culverts, etc.)
- roadside furniture (road signs)

Output: Inventory of all roads and paths

Traffic counts

Purpose: *To establish traffic levels & composition*

Methods:

☉ Manual or automatic count traffic levels

- hourly, daily, seasonally

☉ Vehicle classification

- esp. heavy goods vehicles

☉ Vehicle occupancy

- avg. number of passengers by vehicle type

Methods cont...

③ Accuracy depends on **when** counting is done

- avoid high or low traffic times
- e.g. market days, holidays, etc.

③ Accuracy depends on **where** counting is done

- not too close to towns and villages, need to view both footpaths and roads, knowledge of diversions used in rainy season

③ Counts on low volume rural roads should include

- pedestrians, bicycles, etc.

Output: Average Daily Traffic (ADT)

Travel speed surveys

Purpose: *To assess average speeds & delays*

Methods:

⊙ Direct

- relies on in-vehicle observation
- reveals road performance
- e.g. level of congestion, passability

⊙ Indirect

- responses of shippers, transporters & passengers
- reveals waiting times, loading/unloading times, etc.

Output: Average speeds & delays

Road maintenance surveys

Purpose: *To establish state of repair of the local network and need for remedial works*

Methods:

- ④ Visual inspection, or
- ④ Instruments to measure key characteristics
 - surface roughness
 - rutting
 - etc.

Output:

- ④ Maintenance management records
- ④ Increasingly stored in computer databases

Axle-load survey

Purpose: *To establish degree of vehicle over-loading & hence damage to roads*

Methods:

☉ Survey of heavy goods traffic and vehicle over-loading

Output: Input into pavement design

Road safety surveys

Purpose: *To establish the location and nature of road safety hazards*

Methods:

⊙ Police records of road accidents

- subject to error & omission
- often inadequate for safety planning
- but recent improvements improved report forms and databases has increased reliability

⊙ Identify potential road hazards based on experience of auditor

Output: Accident rates and trends

Road user surveys

Operator surveys

Purpose: *To gather data on....*

- ⊙ Vehicle productivity and costs
- ⊙ Labour utilisation and costs
- ⊙ Tariffs and fare structures
- ⊙ Route structures
- ⊙ Operating practices
- ⊙ Organisational structures within the industry

Methods:

☉ Interview operators of trucks and public transport

Output:

☉ Information about service provision to isolated areas

☉ Candid view of regulatory policy

Driver surveys

Purpose: *To gather similar data to operator surveys*

Methods:

⊙ Interview drivers (who are often different from operators)

Output:

⊙ Yields different perspective to owners on operating practices

⊙ Particularly useful for informal sector where few records kept

Farmer surveys

Purpose: *To gather information (similar to operator surveys) on farm vehicles and their use for carrying goods and people*

Methods:

☉ Interviews with farmers about motorised and animal powered vehicles

Output:

☉ Farmers' perspectives on and transport service provision

Passenger surveys

Purpose: *To obtain information from passengers about:*

⊙ *Satisfaction with service provision*

⊙ *Waiting times*

⊙ *Loading patterns*

⊙ *Average travel distances*

⊙ *etc.*

Methods:

◎ In-vehicle observers

- monitor numbers boarding and alighting
- measure vehicle speed
- measure vehicle utilisation, productivity & revenue earnings
- interview passengers about perceptions of service

Output:

◎ *Vehicle productivity indicators*

◎ *Indicators of performance of transport services*

- as perceived by observer
- as perceived by passenger

Shipper surveys

Purpose: *To measure journey distances & times for consignments and quality of haulage, tariffs, availability of choice, etc.*

Methods:

☉ Interviews with goods consigners (e.g. farmers)

Output:

☉ Contributes to measurement of performance of transport service, as perceived by users

4. Demand side surveys

There are two types of demand surveys...

'Traditional' travel demand surveys

Participatory surveys

'Traditional' travel demand surveys

- © Largely quantitative
- © May be put into transport planning modules

Origin-destination surveys

Purpose: *To identify population's current travel patterns*

Methods:

- ⊙ Sampling to identify movements & variations between pre-defined origins and destinations
- ⊙ Often carried out at household level
- ⊙ Should capture all trips (including non-motorised)

Output:

- ⊙ Matrix or
- ⊙ Map showing movements between zones

Cordon and screen-line surveys

Purpose: (similar to origin-destination surveys, but smaller scale)

Methods:

- ⊙ Create imaginary screen line or cordon around area of enquiry
- ⊙ Assess traffic movements across screen/cordon

Output:

- ⊙ Matrix/map showing movement across screen/cordon

Stated preference surveys

Purpose:

☉ *To try to establish how respondents **might** respond to proposed transport changes*

Methods:

☉ Respondents given opportunity to make choices between transport options

Output:

☉ Measure of likely support/demand for particular option

☉ Measure of how respondents 'trade' between different attributes of transport options (e.g. time vs. money)

Revealed preference surveys

Purpose:

- ◎ *To monitor how respondents **did** respond to a transport change (in retrospect)*

Methods:

- ◎ Respondents asked to evaluate completed changes

Output:

- ◎ Measure actual support for changes
- ◎ Used as a model for future change

Participatory surveys

- ◎ Participatory methods increasingly used in rural transport surveys
- ◎ Due to...
 - past failure to involve poor people in developing and refining public policy
 - focus on sustainable livelihoods (see 5.3)
- ◎ *Seek to understand context and problems perceived by local people, and get them involved in developing solutions*

Village leadership discussion

Purpose:

- ◎ *To gather base data about...*
 - *community*
 - *travel patterns*
 - *transport constraints and problems*

Methods:

- ◎ Structured discussion

Output:

- ◎ Baseline community data
- ◎ Further dialogue with villagers

Participatory poverty assessments (PPA)

Purpose:

- ◎ To gain a deeper understanding of causes and consequences of poverty
- ◎ To understand how rural poor perceive their status

Methods:

- ◎ Participatory ranking, scoring, mapping, etc.

Output:

- ◎ Qualitative data
- ◎ Enables transport practitioners to
 - learn about poor people
 - assets available to poor people
 - capacity of poor people for recovery

Rapid & participatory rural appraisal

Purpose:

☉ *To facilitate analysis by local people of their own conditions*

Methods:

☉ (To be discussed in Lesson 5.6)

Output:

☉ Qualitative data

Conclusion

- ③ Increasing emphasis on transport services that meet local people's needs
- ③ Requires participatory approaches
 - appreciation of local knowledge
 - understanding transport's contribution to sustainable livelihoods
- ③ But also continuing need for traditional surveys

Applying survey techniques



Group Discussion

Which tools presented have been useful or might be useful to the participants in their work?