



Ministry of Rural Development
Government of India



**Pradhan Mantri
Gram Sadak Yojana**

New Technologies and Innovations in Rural Roads
New Delhi, India, 24-26 May 2022

Rural transport services

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Outline

- Access, infrastructure and rural transport services
- Rural transport services demand, supply and characteristics
- Increasing use of motorcycles (and motorcycle trails)
- Regulation and enforcement
- Electrification and electronic technologies
- Need for an integrated approach
- Transport services outcome indicators
- Conclusions

*Drawing on photos
taken by
Paul Starkey
(mainly in South Asian countries)*



Access, infrastructure and rural transport services

- Rural connectivity, as provided by PMGSY, is vital for socio-economic development
- Most rural people in low-and-middle-income countries (LMIC) do not own motorised transport
- They depend on transport services to allow men, women and children to access markets, clinics, education and livelihood opportunities
- Road agencies should engage more with rural transport services to ensure rural roads are appropriate for local transport services
- Simple transport services indicators should be included in roads databases



Access, infrastructure and rural transport services

- Rural roads are very subsidised assets.
- But in LMICs transport services are left to the private sector and market forces
- Transport demand on rural roads is low compared with urban and inter-urban roads
- As societies become richer, more people own cars and motorcycles, reducing transport services demand
- The most vulnerable people (such as poor women, elderly, children and people with disability) depend on transport services
- In high-income countries rural transport services depend on subsidies



Demand for rural transport services

Rural residents are diverse, and include women, men, children, older persons and people with disability

People have different travel needs and the main rural transport demands are:

- Transport of people with goods to and from the nearby market
- Transport to and from a nearby town for employment (commuter transport)
- Transport to and from schools, notably secondary schools
- Transport to and from clinics and hospitals
- Transport to and from the national long-distance transport network for family, business and other visits



Demand for rural transport services

Rural men and women want transport services that are

Pakistan

Timely

Affordable

Easily accessible

Appropriate and safe

Carry goods

Pakistan

Timeliness and affordability are often the highest priority but women give higher priority to safer and secure transport



Supply of rural transport services

- Rural transport services are generally operated by the informal private sector
- Some states have parastatal bus companies, but these generally operate on urban and inter-city routes (but may start in villages with commuter services)
- Most villages are served by smaller vehicles, particularly in off-peak hours
- Three-wheelers including autorickshaws may operate route-based services rural areas, carrying six or more passengers



Characteristics of rural transport services

- Smaller vehicles may be owner-operated or leased for a daily fee
- Informal operators must make a profit on each journey (bus companies only need to make an average profit)
- Profit may be maximised by overloading or using low-cost vehicles
- Waiting for a profitable load is easier with small vehicles
- Waiting for a profitable load increases travel time uncertainty and can lead to a descending spiral of low demand
- Introducing timetables (perhaps by driver associations) can lead to ascending spirals of transport supply and demand



Rural transport services with 4-wheels (or more)

All modes have advantages and disadvantages, and different operating costs and fare pricing

Buses (mainly inter-urban roads)



India

Passenger trucks



Myanmar

Minibuses (need good roads)



Timor Leste

Jeeps / 4x4s



Nepal

Pickups



Myanmar

Rural taxis



Myanmar

Rural transport services using intermediate means of transport

All modes have advantages and disadvantages, and different operating costs and fare pricing

Autorickshaws

Nepal



Motorcycle three-wheelers

Myanmar



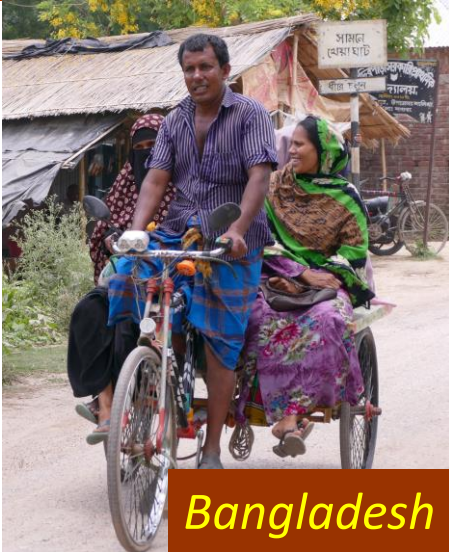
Motorcycles

Myanmar



Bicycles/Tricycles

Bangladesh



Animal power

Myanmar



Power-tillers

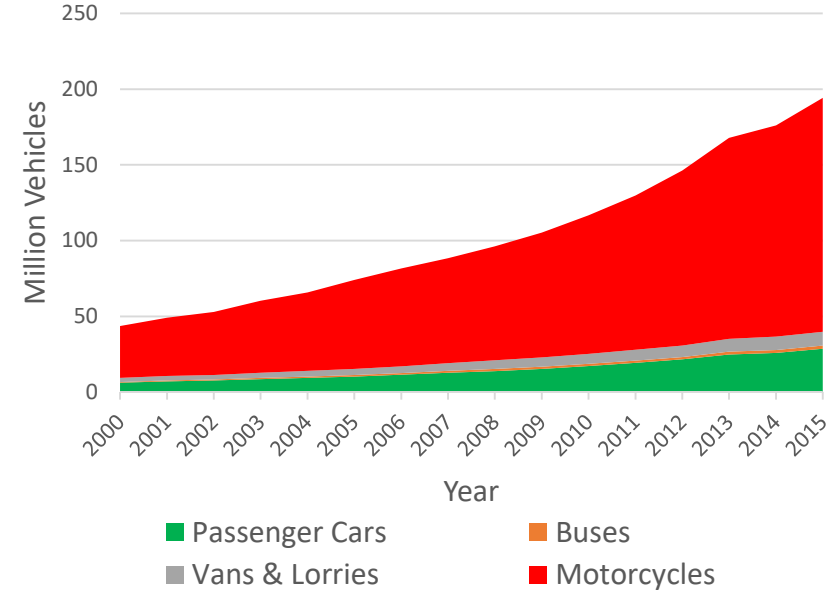
Myanmar



Increasing importance of motorcycles

- In most LMICs, motorcycles are now the commonest vehicles on rural roads
- More than 250 million two-wheelers are registered in India
- In a recent rural survey in Pakistan, motorcycles accounted for one third of men's journeys.
- Men's use of transport services had declined

Vehicle growth in India 2000-2015



Traffic survey of eight rural roads in Punjab Province, Pakistan

Transport type	Numbers	Percentage of traffic
Motorcycles	14,960	62.7%
Three wheelers	3,006	12.6
Pedestrians, cyclists	2,995	12.5
Vehicles with four (+) wheels	2,907	12.2
Total	23,868	100



Motorcycle taxis

- In many countries, motorcycle taxis offer timely point-to-point transport services in urban and rural areas
- These are timely and convenient but expensive per passenger-km compared to larger vehicles
- The regulation of motorcycle taxis can be problematic



Motorcycle trails and trail bridges

- Motorcycles can travel on trails and over inexpensive bridges
- Motorcycle trails are now recognised by Sum4All/World Bank as a serious option to improve rural access
- Motorcycle trails are cheap and quick to build
- They allow off-road villages to be connected to the road network
- Politically, motorcycle trails must be presented as *additional* to roads to connect the smallest communities



Regulation of rural transport services

- Transport services regulators tend to be small (compared with roads authorities) and focus on administrative compliance and revenue raising
- They concentrate on urban and inter-urban transport sectors and seldom engage with rural routes
- Transport operator's associations can provide useful self regulation, but they can become powerful cartels that remove incentives to improve
- Regulations generally make it illegal to carry passengers and freight in the same vehicle, but that is what rural people want
- Lack of enforcement allows mixed transport operations



Universal access

- Transport services should be appropriate for all users
- Modern urban buses have 'universal access' with a horizontal step allowing easy access
- On rural routes older buses have steep steps and thin handrails
- Due to costs, moves to universal access on rural routes will be slow
- Education can promote empathy towards vulnerable travelers



High-clearance rural bus with difficult access



Low-floor urban bus



Rural bus with steep steps, tight corner and narrow handrails

Enforcement of transport services

- In rural areas, regulatory enforcement by sympathetic local police is low
- Some police favour non-compliance of transporters as they can extort bribes



Nepal



Bangladesh



Myanmar



Pakistan



India



Timor Leste



China



Thailand

Battery-powered and smart transport services

- Battery-powered transport is increasing
- Rural transport services will electrify slowly due to older vehicles, longer distances and less charging infrastructure
- Smart ticketing and GPS-tracking technology will also lag behind urban and inter-urban buses
- Ride-hailing apps linking transport demand to available vehicles will become increasingly important in rural areas



Need for an integrated approach

- Road engineers and planners should understand the socio-economic importance and realities of transport services.
- Rural roads and transport services should be planned together



Collecting indicators of transport services

- Measuring beneficial **impacts** of roads is expensive and only happens occasionally
- Monitoring the beneficial **outcomes** using transport services indicators is easy and cheap
- Simple outcome indicators can show how transport services respond to road investments and to road deterioration
- Outcome indicators include transport tariffs, frequency of public transport and modal composition of traffic and public transport
- When road surfaces improve (or deteriorate) there is often a modal shift in transport types (eg jeeps vs minivans)



India



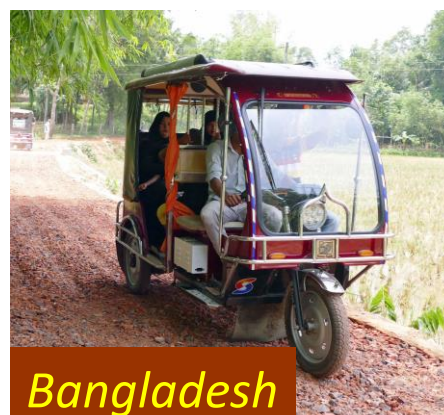
Pakistan



Nepal



India



Bangladesh



Pakistan



Nepal

Rural transport premium: $\frac{\text{Rural transport fare per passenger-km}}{\text{Long-distance bus fare per passenger-km}}$

- The Rural Transport Premium (RTP) is the ratio between the fare per passenger-km of transport services on low-volume rural roads and the fare per passenger-km of long-distance standard bus services.
- Being a ratio there are no units, removing issues of changing fuel prices or exchange rates
- Long-distance buses are cheap per passenger-km, as they run on national roads, with large loads over long distances.
- The RTP varies with vehicle type, transport demand and road quality
- Collecting information on transport services types and tariffs is simple, and the RTP can be included in roads databases
- This would allow outcome indicators (eg RTP) to be used in decision making for road maintenance and planning



Conclusions

- Rural transport services are needed for the beneficial impacts of the PMGSY roads
- Road authorities can monitor this by collecting simple data on transport services
- Including transport services indicators in roads databases can help planning road provision and maintenance
- Small communities beyond the PMGSY network can be easily connected by motorcycle trails and trail bridges.





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