

Safe rural roads and the safety of rural people

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Summary

This presentation is illustrated with clear and memorable photographic examples from many countries. Transport brings benefits and safety issues. Rural road safety is complex with numerous stakeholders including engineers, vehicle drivers, passengers, users of intermediate means of transport (IMTs) and many types of pedestrian. These have different exposures to danger and acceptance of risks. There is need to understand and minimise risks and ensure equitable benefits of rural roads. Road-related accidents are under-reported. They are caused by driver behaviour, vehicle loading, vehicle condition, traffic mix, weather and unexpected events. Road design, construction and maintenance affect safety in numerous ways including pavement condition, obstructed shoulders, appropriate sidewalks and IMT lanes, pedestrian crossings, traffic calming and location of transport stops. Buses are relatively safe, motorcycles are high risk and bicycles and pedestrians are very vulnerable. Motorcycles are increasing in many countries, providing benefits and safety risks.

In response to accidents, national regulations drafted in cities oversimplify complex issues with prohibitions and compulsory requirements that may disproportionately affect rural transport. Mixed transport is important in many remote areas, but it is often illegal to carry passengers in goods vehicles. This may deny passengers insurance cover. Regulations may require local modification to ensure relevance. Safety legislation for roads, vehicles and road users is enforced by regulators, police, courts and contracts. Where there is corruption, safety regulation is extremely difficult to enforce. Making roads safer is time-consuming and requires all stakeholders increasing consideration of other road users. Reasons for unsafe practices must be understood, solutions proposed and fairly enforced. Transport operators, public opinion and champions should be engaged to promote changes in behaviour, vehicles and infrastructure with adequate funding mechanisms.

Problem of rural safety

Life is risky, with many different and competing risks relating to health, livelihoods and mobility. Transport infrastructure and means of transport may improve the quality of life, but at some risk of accidents. Rural people have diverse perceptions of risk. Different people may gain or lose disproportionately from rural transport systems and safety regulations. Risk and safety are gender issues, with women more likely to avoid risky transport situations where practicable. Compromises have to be made to ensure the benefits of rural roads are equitable and avoidable risks are minimised.

Causes of accidents

While safety is a multi-dimensional issue, indicators of safe rural roads are often based on the number of road-related accidents, which may range from minor to fatal. Statistics are often unreliable due to the under-reporting of accidents. For example, injuries sustained from falling off a bicycle with no brakes are unlikely to be reported in Zambia. Rural roads have many types of vehicles (trucks, buses, minibuses, pickups), intermediate means of transport (bicycles, motorcycles, carts, pack animals) and pedestrians (farm and market journeys, school children, livestock herders, old people crossing the road). Road related accidents may take place on the road itself, or on associated shoulders, embankments, bridges, ferries, quays, footbridges and transport stops.

Numerous different factors influence the number of accidents and their severity. These include:

- Driver behaviour (speed, risks, concentration, tiredness, alcohol, drugs)
- Driver practices (load size and distribution, direction of travel, stopping and parking)
- Vehicle specification and condition including IMTs (brakes, lights, reflectors, seat belts, emergency exits, fire extinguishers, first aid materials)
- Infrastructure design, construction, maintenance, condition including
 - Geometry, curves, drainage, width, gradients
 - Pavement (good surface encourages high speed, poor surface increases wear and tear, vehicle deterioration, driver tiredness)
 - Bridges, drifts, culverts, embankments
 - Obstructions (rocks, landslides, trees, branches, maintenance materials)
 - Shoulders (condition, surface, obstructions including sellers and vegetation)
 - Safety barriers, including bioengineering
 - Pedestrian crossing (design, platforms, islands, visibility, signs, signals)
 - Sidewalks (maintained, unobstructed, consistent)
 - Lanes for IMTs (protected, maintained, unobstructed, consistent)
 - Bus stops and terminal location and design
 - Location and regulation of local markets and roadside sellers
 - Traffic calming
 - Signs and information
 - Associated infrastructure, access paths, footbridges, ferry quays
- Weather extremes, flooding, landslides, subsidence
- Traffic mix (pedestrians, trucks, buses, pickups, cycles, motorcycles, animal carts, herded animals)
- Visibility, lighting
- Unexpected events (animal movements, child behaviour, vehicles on quiet roads)

Safety of transport services

The risk of accidents affects all road users, whether drivers, passengers, pedestrians, IMT operators or the herders of livestock. Public transport services are generally quite safe. Buses are one of the safest modes of transport per passenger kilometre. Minibuses are more risky than larger buses partly due to higher speeds and greater manoeuvrability (encouraging riskier behaviour). Their clearance and braking systems make them less suitable for rough mountain roads. Public concern over public transport safety is often in response to horrific accidents with multiple fatalities, although many more lives are lost or spoiled due to small accidents due to fast vehicles colliding or hitting pedestrians or cyclists.

Bicycles and motorcycles may be at high risk of accident due to people's behaviour (lack of consideration by riders and by other road users), their instability when balance is impaired (by potholes, loads, speed, knocks or alcohol) and their lack of user protection. Motorcycles are also often at high risk due to their use by risk-taking young men. Even where crash helmet regulations are enforced for drivers, passengers, particularly young children, often remain at risk. In many countries, informal transport services have developed using bicycles and/or motorcycles. In many countries in Africa, Asia and Latin America, there is a major and rapid trend towards greater use of motorcycles for personal use and sometimes transport services. This trend seems likely to continue and countries without large numbers of motorcycles (including several in Eastern and Southern Africa) should start to plan for increased motorcycle use and its implications for road safety.

Regulation for safety

Regulations made at national, district or local level can determine what transport-related practices, designs and quality are acceptable. Regulators may be governmental, statutory

authorities or transport associations. Regulators try to solve particular problems through specific rules and tend to work in black and white, making things either compulsory or prohibited. In practice safety is highly complex and multi-dimensional, and requires 'situation appraisal' which is very difficult to codify in regulations.

In many countries, national regulations tend to be enacted by relatively privileged people, who are often urban-based men accustomed to driving in private motor vehicles. It is not uncommon for politicians and regulators to have direct or indirect links with transport businesses. Transport safety regulations tend to favour modern motor vehicles and urban-based transport businesses and may give insufficient attention to the safety and livelihood needs of rural people (including women and children), pedestrians, livestock owners and informal-sector transport operators. In many countries it is illegal to transport passengers in freight vehicles or carry a second person on a bicycle even though these practices are common (and perhaps necessary) in remote rural areas.

Some regulations are made in reaction to horrific accidents. These tend to prohibit particular practices (carrying passengers in open trucks, carrying dangerous substances in buses) or technologies (old buses, ropeways). More objective concern for overall safety might concentrate on better education and enforcement. Blanket regulations may marginalise remote rural transport operators and passengers, by reducing access to low-cost vehicles and removing legality (and thereby the possibility of obtaining insurance cover for passengers and their dependents).

Enforcement of safety

Safety regulations may be enforced by regulators (testing agencies, local government officials, transport associations), the police and judiciary, as well as by private litigation. Construction and maintenance contracts can be used to enforce infrastructure safety.

If there is corruption within the regulators, the police and the courts, enforcement becomes extremely difficult and variable. Compliance with safety regulations is closely associated with the fear of the consequences. Corruption reduces the fear of adverse consequences, and perversely may make compliance unattractive (why fix the problem when I have already paid money to the regulator and/or checkpoint personnel?).

Enforcement of safety regulations often varies with date, time, district and remoteness, due to many factors including corruption, local understanding and lack of resources. This may diminish and/or increase respect for the law and local enforcement agents. In some rural areas, including Lesotho, out of necessity, police officers and court officials may ride as passengers in illegal public transport vehicles.

Public opinion can be mobilised to assist enforcement. In some countries newly emerging public opinion is making driving following drinking less acceptable. In Kenya, passengers shouting out against bad driving had a significant effect on accidents and insurance claims among a group of mini-bus drivers.

Reducing problems

One reason why safety is a highly complex issue is that many problems are due to human behaviour, and this is extremely variable and often inconsistent. People may favour regulation for others but not change their own behaviour. The ongoing limited use of seatbelts in taxis (an easy practice with almost zero cost) illustrates the long-term problem of changing behaviour.

Since a high percentage of accidents are due to human behaviour, education and awareness campaigns must be used, backed up by consistent and fair enforcement. Empathy,

understanding and reasonable behaviour must be promoted between different road users (including pedestrians and local residents). Reasons for unsafe practices need to be understood and potential solutions targeted. For bus and minibus services, effective regulation for timetables, and average speed checkpoints could help overcome some speeding problems. Competition for improved safety should be encouraged within and between transport associations and service providers. Public opinion should be mobilised, with transparent discussion on what technologies and practices are reasonable in given areas and situations. Local and national champions should be encouraged to endorse safe behaviour and practices.

In countries with motorcycle taxi services, including Rwanda, enforcement of drivers wearing high visibility jackets with large personal numbers has been found a simple way of reducing dangerous behaviour that also makes it easier for the public to support regulation through reporting.

Conclusions

Making roads safe for rural people is very complex. It involves long-term behaviour adjustments for all road users, road engineers and regulators, with greater awareness of risk and enhanced empathy and consideration for different road users achieved through education, training, campaigns, models and champions. Funding to achieve greater safety should be allocated as a realistic proportion of infrastructure and maintenance costs.

Regulations must be adapted to local people and their transport needs. In remote areas, public transport operators should not have to operate illegally and without passenger insurance due to regulations intended for inter-urban roads. Enforcement should be reliable, predictable and consistent, and appropriate to local stakeholders. Where enforcement is inadequate, litigation may be a mechanism to improve standards (fear of legal consequences is improving awareness of safety issues in some countries, although excessive litigation is likely to be vexatious).

Local people and transport associations can stimulate compliance with regulations. Transport operators should compete on issues of comfort and safety. In the coming years, safety on rural roads is likely to be influenced by climate change and by an increasing numbers of motorcycles in use.