

Accessibility Planning

David Tighe,

*Corresponding Member representing Canada on
PIARC C20 Committee "APPROPRIATE DEVELOPMENT"*

Date prepared: October 18, 2000

Revised September 2006

1. ***What is accessibility and mobility?***

Accessibility is a measure of how easy a place is to get to. A place is *accessible* when a person can get to it with what he or she considers an acceptable outlay of time, effort and money. A place is *more accessible* when it takes less time and effort (and possibly risk and expense) for an individual to get there. A place is *inaccessible* when the outlay to get there is greater than the benefit the person expects once arrived. It is generally a value-loaded concept and does not lend itself to absolute statements. Rather it provides a pragmatic measure for choosing between alternatives.

Mobility is a measure of the ease with which people can move around. Places become more accessible when a people are more mobile. By putting services beside the people who need them the need for mobility is lessened. However, what about the people who have to come to staff the services and what about getting things to them? Their accessibility can be reduced. Also, greater mobility reduces isolation by facilitating interactions and an increased flow of information. In any case there are increasing diseconomies of scale due to fragmentation when services are moved closer to users. In summary, making services more accessible will always involve a tradeoff between moving or multiplying services and making it easier for people to get around.

Greater accessibility therefore comes at a cost. People came be made more mobile, or they can be located closer to the service or vice versa. Within the accessibility equation, travel time has a cost (which they may not be able to afford) and can also involve risk (of accidents, of not getting there, or taking more time than foreseen due to problems along the way). Risks also exist independent of speed, for example people on foot slipping and falling in difficult terrain, a common cause of injuries and even deaths in rural areas. Also to be considered is how often the place needs to be visited and what is the intensity of the need. For example, medical emergencies versus produce marketing.

2. ***Roads are not the only contributors to accessibility***

A decision to invest in roads is in fact a major decision to invest in improved accessibility by increasing mobility. However, the investment is traditionally made with little knowledge of what the impact of mobility will be on accessibility (or even whether a road will contribute to mobility) and whether the same amount invested in other ways could have a greater impact.

How did this narrow viewpoint become the norm? Because we have proceeded by analogy with larger road networks. These normally connect fixed nodes, cities or towns with large numbers of users. There are fewer alternatives to improving accessibility (we could propose telephones or a rail service but often don't) so we do not look further. In any case, bad investments are made here too through taking too narrow a view. Roads are often built whose use does not justify the expense.

3. *Planning should be centred on accessibility improvement*

In the past, roads have been assumed to be the only way of linking rural communities to services. Since they are particularly expensive, as is motorised transport in general, this has often resulted in a waste of money. Thus, evaluations of road projects have often found that impact on living standards has been slight to the point that they conclude that increased accessibility has a minor if any impact on poverty reduction, or at best only a very indirect one. However, rather than throwing out the baby with the bathwater, what could have been concluded is that although the road did not significantly improve accessibility, other forms of investment could perhaps have done so.

We conclude that planning rural road networks (those that connect spatially dispersed and poor communities directly with services or higher level collector roads which lead to them) must be subordinated to accessibility considerations. In fact, all investments which make places more accessible, whether by making people more mobile or simply bringing them closer to users, must be integrated within a single planning process.

4. *Defining usable accessibility criteria*

This means that a very wide range of alternative ways of providing accessibility must be analysed before investing. It also requires a close look at which facilities must be more accessible and to whom if we are to maximise impact on poverty. In the context of Roads Department-centred planning we cannot make these tradeoffs.

We also need a close definition of an accessibility scale that can be folded into an index which would allow ranking strategies. Alternatively, we can beg the question by relying entirely on consultation with stakeholders. This does not eliminate the need for indices (which try to make the consequences of value judgements explicit « *this one is better than the other because the number is bigger* ») but admits some fuzziness by allowing more dimensions in the decision space instead of trying to fold them up into one. Choosing becomes more difficult. The emphasis will be on

providing clear descriptions of one strategy over another so that people can agree, « *despite our differences we prefer this one rather than the other* ».

We all agree that accessibility is necessary if not sufficient for development. At the extreme, people totally isolated from the social mainstream cannot but be poor. Also that improving it is costly. We don't know how accessible services should be nor what is the link with living standards. We do seem to agree on the fact that, in a context of insufficient funds and poverty, priority should be given to ensuring that everyone has a minimal level of accessibility to essential services. Only then can we start to debate about how accessible services should be and which groups (the very poor, women) should get special treatment. There are already enormous disparities in accessibility between urban and rural areas, a fact well demonstrated by the growth of cities which attract people from rural areas for just this reason. This in itself, is an adequate justification. The first step in measuring need must be to devise ways of determining who has not this minimal access and then to develop ways of providing them with it as cheaply as possible.

5. *Who should do accessibility planning?*

Roads departments should be *participants* in the process, not the exclusive planning engine. They know about roads (and non-motorable tracks perhaps) and how to build and maintain them. This is the only knowledge they bring. They do not know about transport system characteristics and needs except in very general terms, since they are almost entirely concentrated on the particular needs of the motor vehicle. They have not concerned themselves with non-motor vehicle users and their needs, nor have they considered the road transport environment which determines whether or not transport services will materialise if a road is improved. Finally, they are not in a position to trade off road improvements against other ways of making services more accessible. Worse, there is a conflict of interest, since road departments justify themselves by building roads, preferably good and expensive ones.

Who are the people who know about these things and how can they participate in the planning process? There is no Ministry of Accessibility. Many departments have an interest, notably those who manage the services people want. However, the people most concerned and most knowledgeable are *those who cannot get to the places they need to go to*. Obviously, they should be the centre of the planning process. The role of the departments who provide the services or the means of getting to them should be to clarify the consequences of the decision they take. In other words, throw light on the trade-offs between costs and consequences, and also define the financial envelope and the strings attached to it. Afterwards, they should ensure that local level measures to improve accessibility will not be hindered by bad decisions at higher levels, or more positively, make national level changes that support local level initiatives.

6. *What are the limits of accessibility planning?*

When can accessibility planning be allowed to fold itself up into a simple question of road planning as it is treated now? This is important since we must define a space within which the accessibility-based approach is valid. It is too cumbersome to apply to large areas since it requires quite heavy data collection (although generalisation from similar situations could become possible with time). Also since it is community-centred, it is limited by the area within which the concept of community holds.

The present situation in rural areas has arisen mainly by default. Road departments took charge and applied the methods they were used to, and which, for that matter, donors insisted upon. In cities, where the problem is similarly multi-dimensional, it is accepted to be within the domain of urban planning which integrates land use, accessibility and modal competition into the process. No city would entrust the task to its roads department!

We propose a utilitarian criterion. For example, road network planning can revert to conventional practise when the problem can be defined without too much loss of reality as simply one of facilitating motor vehicle movement. In other words, when we are dealing with a road network where there are enough users to benefit sufficiently from good roads to allow trading off investment in road quality against their gains. Roads tend to be very little used by motor vehicles in contexts where accessibility planning is useful. In fact, many may have become impassable. When the network is visibly used by an easily countable number of vehicles, accessibility planning becomes largely a question of road improvement and can revert to the appropriate department. However, the impact of their decisions on local accessibility needs must be screened at the local level and modified if necessary. At the same time, local level strategies must be modified to take account of them.

7. *Some basic principles*

- The approach in rural areas must be one of accessibility planning NOT roads planning;
- The people who stand to gain or lose from poor accessibility should be the motor of the process;
- Those who will finance, illuminate by their knowledge the decision-making process, or generally facilitate implementation should provide support. These include road departments (and transport), ministries concerned with rural infrastructure, donors and consultants.
- Planning can be simplified if it be centred on providing MINIMAL OR BASIC ACCESS.

- Accessibility planning can give way to the traditional approach when levels of traffic are sufficient to allow tradeoffs between costs of service provision and benefits to users.

8. Summary

Essentially there are three nested and distinct sets or areas to be looked at:

1. Accessibility planning is the primary set. It covers measuring need in operational terms, defining a hierarchy of measures to satisfy it, and defining criteria to choose amongst them. It also covers the management structures needed, local, regional, national
2. Transport planning is a sub-set, which covers all measures which contribute to mobility, including of course motorable road construction;
3. Finally, road planning (quality, technology choice, management, maintenance financing etc) is a sub-set, but of course an important one, of transport planning.

Appendix

Some key definitions

Accessibility = f(time, effort, cost, risk, need)

Accessibility is a complex function of the barrier facing the user and his or her need for the service.

Travel time = f(transport system, distance, frequency of use)

Travel time can be shortened by improving the transport system, that is, the combination of fixed infrastructure and the carrier using it. It can also be shortened by moving users and services closer together. The time measure must be considered as an aggregate for all users over time. There is no point in devoting a lot of resources improving access to a place rarely visited.

Effort, cost and risk = f(transport system, distance, frequency of use)

Effort, cost and risk functions are similar to that for travel time. Each transport system involves a certain amount of personal effort, cost and risk that is cumulative over distance and frequency.

Transport system = f(road or track characteristics, means of transport)

A transport system usually consists of a fixed component and a mobile means of exploiting it. For each fixed component there is an optimal choice of means. The fixed component must be chosen to best satisfy the lifetime needs of the means of transport using it. In other words to provide an appropriate level of service.

Road Characteristics = f(level of service, means of transport)

A road offers a vector of qualities which are more or less well adapted to the requirements of a specific means of transport. If they are inadequate speed decreases, effort (or discomfort) will increase, and costs of operation will probably increase. If there is over-provision, money is simply wasted in that the marginal gains to the user are not compensated by the expenditure on fixed installations.

Level of service = f(geometry, materials, construction method, robustness)

Levels of service can be improved by better geometry (more width, moderate slopes, gentler curves), by better materials (smoother and more durable rolling surface), and by the degree of overbuilding (in that robustness has an impact on the durability over time and interacts heavily with maintenance).

Robustness = f(geometry, materials, methods, traffic, weather, maintenance strategy)

Robustness is a function of how well the road is built in the first place, of the forces acting upon it (mainly traffic and weather) and the quality of maintenance.