

ACCESSIBILITY,
PLANNING AND
URBAN POVERTY:
TOOLS FOR
EQUITABLE
TRANSPORT
PLANNING IN
DEVELOPING CITIES

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The role of urban mobility in (re)shaping cities
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Accessibility, planning and urban poverty: tools for equitable transport planning in developing cities

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Abstract

One of the key objectives of equitable transport planning is the delivery of accessibility, that is affordable, available and acceptable (Carruthers et al, 2005). Yet the accessibility needs specific to the urban poor are rarely incorporated in transport planning, a gap that has wider implications in the renewed planning focus that is occurring in cities of Africa, Asia and Latin America. Furthermore where approaches are made the planning practices often rely on expensive data gathering methodologies that are rarely repeated if undertaken at all. This paper will build on work undertaken for UN-HABITAT on developing an *Urban Poor Accessibility Assessment Tool* that seeks to improve the tools available to key stakeholders, including governments, donors and civil society, to identify the specific accessibility needs of the urban poor that would improve equity of planning outcomes and enhance the ability the urban transport sector to contribute to poverty reduction. It will explore a package of methodological approach to rapid appraisal of accessibility within urban low-income communities, it will examine the scope of new technologies and participatory approaches to deliver user group planning practices and protocols within such communities. It will highlight examples of innovative practice in user group planning and in delivering accessibility for low-income communities and it will recommend future steps for work in this area.

Keywords: Urban poverty, accessibility, transport planning, user participation, mobile technologies, developing countries

1. Introduction - What is accessibility?

There is an increasing discussion around access to opportunities and basic urban services in developing cities, its interaction with poverty and the important role that urban mobility plays in that. However, for the transport planning profession such discussion of accession can mean different things in different contexts. Accessibility is not consistently defined and is contested in its definition and use. Accessibility, as defined by the UK Department for Transport within their accessibility planning work, is the extent to which individuals and households can access day to day services, such as employment, education, healthcare, food stores and town centres.

Similarly, work undertaken by the ILO on its Integrated Rural Accessibility Planning Approach,

highlights that travel and transport are related to people's the need to access facilities and services and the need to move goods. Denis (1989) highlights four categories of services and facilities that need access; subsistence, economic, improvement of human capital and other social and business purposes.

By contrast, accessibility as used by the European Commission is a much more restricted definition. Discussions currently ongoing around an possible 'European Accessibility Act' define accessibility as meaning that 'people with disabilities have access, on an equal basis with others, to the physical environment, transportation, information and communications including technologies and systems (ICT), and other facilities and services in line with Article 9 of the UN Convention on the Rights of Persons with Disabilities (UNCRPD), to which the EU is a party.' The later definition is also common in programmes such as the Brazilian Urban Accessibility Programme, in advocacy efforts such as the Access Exchange International.

Similarly associated with these definitions, is the academic research undertaken (mostly in North America) as part of the Spatial Mismatch Hypothesis. This Hypothesis claims that there is a substantial 'mismatch' in urban North America between where poor people, particularly people of particular ethnic groups, live and the employment opportunities available to them and the access problems and travel times they face access these opportunities.

The 'Cities on the Move' report (2002) highlights accessibility as one of the key strategies for enhancing the poverty-reducing powers of urban transport strategy. The report highlights that Transport improvements can be focused on where poor people live and work. These improvements may involve concentrated efforts to improve access to slum areas or to improve public transport to peripheral locations. The World Bank-supported Pavement Program in Low- Income Areas (Programa de Pavimentacao de Baixo Custo em Areas de Baixa Renda—PROPAV) in Brazil proved highly successful, and was extended throughout the country, as well as to other Latin American countries. The World Bank report highlights that leakage through land rent changes must be taken into account. It argues that transport investments or service improvements change the structure of land values. If there is strong competition for the use of land and highly concentrated ownership of land, rents increase in improved areas and the benefits of transport improvements accrue to rich landowners rather than to poor land occupants. Some investments— such as improvements in bus or NMT systems— are less likely to drive poor people out to more distant, less-expensive locations than are others—such as primary roads or more highly priced, mass transit systems. This finding further emphasizes the need for transport to be part of a comprehensive urban development strategy. The work of Carruthers et al (2005) also highlights accessibility as one of 5 components of urban transport including it being affordable, available and acceptable.

2. Urban mobility, accessibility & low-income communities in the Global South

There has been a noticeable and growing literature on urban travel and transport of low-income communities in developing cities (see proceedings for CODATU conferences in 2002, 2006 and 2010). All of the work above points to the fact that overall low-income residents of developing cities make a reduced number of trips and user slower modes to make them, particularly the focus on walking as a result of constrained income. This is particularly accentuated when one looks at the differences across social groups.

In particular, within this literature, if you look at the difference in travel between men and women, women's multiple roles and their associated 'time poverty', impacts significantly on the ways they travel (Turner, 2012). It influences how much time they spend travelling. It influences who they travel with and for what purpose. Perhaps most significantly, it influences the scheduling of the journeys that are made. Women's greater 'time burden' often means that their trips need to be made between doing other household tasks. As a result, any changes in travel time impacts upon these other time tasks.

Reliability and the ability to minimise the knock-on effects of travel disruption upon other household tasks may, therefore, be much more important for women's travel than for men's.

A key difference, however, between men and women's travel patterns is the propensity of women to combine a set of activities relating to their extensive range of household tasks within the overall structure of one journey period (called trip chaining) whereas men are more likely to make a single purpose unaccompanied trip. Access to financial resources does allow some women to overcome such time burdens. Many middle and high-income women are increasingly reducing the time required for travelling by securing independent access to a car. Women also perceive a greater degree of risk to their personal security whilst travelling and are also often victim to considerable degree of sexual harassment or the threat of harassment. Research in Lima, Peru (Anderson and Panzio, 1986) and in Jakarta (Turner, 2012), showed how women's behavioural responses to safeguard against physical attack and sexual harassment on public transport vehicles restricted their use of all types of transport.

Furthermore, much of the research undertaken to provide these understandings are informed by surveys that are still largely ad-hoc and often not repeated due to the cost and effort. There is still little systematic monitoring and less reporting of regular and systematic travel surveys within which low-income communities and their travel is included (Turner 2012).

Age structure is important largely in respect of children and the retired. Pre-school children are unlikely to make any significant trips except in the company of elders. While all school children make school trips their mode of travel may well be influenced by their age; young children will have only a short trip to a local school which can be accomplished on foot, while older children attending secondary school and colleges will inevitably travel further, possibly using some mechanised mode. Lida Song (1989) also noted, in Beijing, a large (over two-thirds) increase in trip making as students progress from primary to secondary education age. The same study also demonstrated the rapid drop in trip making which results from old age.

Furthermore, there is little acknowledgement that much travel, particularly walking is accompanied or escorted. The work of Hodgson (2012) describes the importance of escorted journeys and their connection with walking. She argues that escorted journeys are a networked practice. Escorted journeys are a response to the perceived need to provide support or to ensure the journey is safer. The experience, perception or knowledge that there are times or places when it is less safe to travel unaccompanied is common and one shared particularly by women throughout the world in both developing and developed countries and throughout history. Journey's then, are not simply a matter of getting from *a* to *b* or even the accessing of some resource at the scheduled stops and destinations, there is an intrinsic value to the practices of journeying particularly as it affords opportunities to develop competencies, strategies and capabilities along the way.

The need to use escorting practices can impose additional burdens on households. It is a use of resources, of time, and a need to engage in synchronising, planning, and coordinating between household members, other households, the temporal and spatial patterns of public transport availability as well as those of other facilities and services such as schools, shops, and childcare. The economics of being safe, of providing safety for others in a household are less well informed and understood as part of everyday life and patterns of behaviour and social practices. The evidence suggests that women and men provide escorting practices but little is known about this social practice however, some gaps exist in our understanding of escorting as a social practice and in particular little is known about whether it takes women the same level of resource as men to provide escorting practice for family and social network members. Porter (2002) argues in an African context women have to rely on each other to provide escorting practices due to uneven access to financial and credit resources and power relations. This paucity of access to financial resource means added use and reliance on social resource and little is known about the transaction costs, such as the burden of asking for time favours, involved in arranging such communal practices and we do know that women with dependants are already time-poor compared to men. If a time favour is made then it may have to be paid back and this can again be

an extra cost for women. A further gap in the knowledge is the concomitant impact on patterns of opportunity costs. Little is known about the patterns of lost opportunities that surround women's practices of escorting but in circumstances of 'time-poverty' then women will lose the opportunity to do other things as they provide escorting practice. Equally under-researched is the generation of competencies and other resources through the practice of escorting. Lack of attention to the social meaning of travel and escorting has meant that gaps exist in our understanding and analysis of the potential for the use of new technologies in providing electronic escorting. New mobile technologies particularly those with Global Positioning Systems allow potential to be able to monitor the location of others in social network groups and also as devices to monitor the whereabouts of teenage children and to avoid losing very young children.

Despite a growing literature in this area, there are still significant gaps within our knowledge of access and urban mobility for low-income communities in developing cities. These include limited data on walking and non-motorised transport use especially around urban good transport; a lack of knowledge and reporting of gender differences in travel patterns; a lack of measurement of travel patterns of younger and older people; a lack of awareness and methodologies to capture the travel needs of people with mobility impairment and a lack of knowledge and capturing of the issue of personal security and its role in constraining mobility

3. Tools for measuring access in developing cities.

Many of the understanding and approaches on urban accessibility described above require a good deal of data. The frequent lack of this data and the disinclination or inability of the urban transport planning profession in developing countries to regularly collect such data for low-income communities needs to look at other tools and approaches.

There is a clear need to develop greater understanding of urban mobility and poverty in developing cities. There is also a need to improve the toolkit for professionals to help with this need. In terms of measuring accessibility, there have been a number of efforts and directions suggested in order to develop practical approaches and tools that allow practitioners to capture the level of access experienced by different people. One of the noticeable directions has been around affordability. It has been argued that the cost of public transport in some developing cities presents a barrier to accessing employment and services for some low-income households. Research connected within the Cities on the Move review (2002) and earlier work highlighted the substantial proportions of household income that low-income households were spending on urban transport in some developing cities. Carruthers et al (2005) sets out a methodology for calculating an index of affordability for urban public transport. The index is based on assessment of the amount of income a low-income household has to spend on travel in order to access services and opportunities.

However, there is a problem with this methodology. It is necessary that this assessment is regularly undertaken and despite the work done by the World Bank that culminated in the measurement of the affordability index in 27 cities it has not been updated since 2005. Furthermore, the focus of the methodology is on average trips and on household income, where there has been much work that has shown that in fact low-income households in developing cities often do not work as co-operative, collective entities and income is not equally shared or accessed by all members of the household. For example, who gets access to household income for travel is often not equitable, but is significantly affected by gender bias within the household.

One of the best ways of getting good social impact information for transport planning purposes and of keeping that information updated is to make use of the user group planning techniques. Users have available to them important contextual knowledge which is not easy to obtain from an external perspective and they have a knowledge of system failure which may not be obvious to an external planner (UN Habitat, 2009b). New technologies also permit levels of interaction and knowledge transmission between user groups and agencies which did not previously exist. There is a new

efficiency attainable through electronic participation: feedback systems can exist without unnecessarily disrupting routine administration. Information and communication technologies can readily permit the capture and harnessing of gender data for transport and travel systems which would better service women and most particularly the low income woman both in the developed and developing world.

There is, the authors argue, a need to focus more on the process of understanding and planning for the travel and access needs of low-income communities, than a single, static indicator. There are, for example, a range of not-for-profit technology-based tools and advocacy processes that are of interest. These draw on Web, SmartPhone and SMS-based technology based mapping and reporting tools and include a UK based one called 'FixmyStreet' www.fixmystreet.com which is web-based reporting site for urban management to enable residents to report faults in urban maintenance and management. There is also another one based in India, called, Transparent Chennai www.transparentchennai.com which has been developed as part of a wider accountability campaign to allow citizen mapping and oversight of urban facilities and services management with focus on particular issues, including the provision of toilets and sanitation for low-income communities.

In the developing world, new information technologies would allow users to provide direct feed-back on their transport experience and difficulties to service providers and donors. In the past, user group experiences were relayed to central donors by means of expert opinions and desk officer reports. Rarely was it the case that users enjoyed any form of direct interface with those who determined the funding and planning of transport provision. The new electronic capabilities of the central donors permit new forms of feedback which are direct. Financing user groups to meet as part of a transport development strategy is not fundamentally different to financing user groups to be directly involved in a transparent dialogue with donors as to what their needs are.

4. Mobile technology-based tools for accessibility measurement

This study sought to explore the development of an accessibility tool that can set out a process and a set of techniques to assess the accessibility of low-income urban communities to services and opportunities. It is proposed to build on the mapping approach as exemplified by the work of Hodgson (2011) and Evans & Jones (2011), by using GPS to track routes, services and paths used by low-income communities to access services by different modes. It is also proposed to build on and develop the work on affordability to assess affordability of public transport from a heterogeneous perspective of affordability for different members of the household, not just the household as a whole. The methodology, explored in this paper, is intended to be undertaken as a rapid assessment process using limited number of people over a short-period of time and that can identify where more assessment and effort is needed in order to develop robust solutions.

The tool also explored the use of GPS to track walking routes taken by low-income residents to key service locations (eg hospitals, religious establishments, local schools, markets, industrial parks, rail stations) in order to develop maps of key walking routes as part of informal settlement improvements

In addition to the use of mobile technologies to map travel routes, there is a need of community participation. Many transport users particularly women have trouble bargaining their place onto informal public transport. It is necessary to analyse the transaction costs of accessing of informal public transport. It is proposed in this method to observe some busy public transport pick up places and identify who is able to get on and how often women do not make it on to the vehicle. There is also a need to collect data directly from households in order to ground this mapping data in experience. Within this exploratory method, efforts should be made within a specific location to identify users of transport at bus stops and using snowball interview techniques go into communities and identify non users and occasional users of transport services and identify the constraints and barriers that strand these people in very localised areas.

The methodology developed had a series of objectives which are not intended to be hierarchical but considered in an inter-linked and inter-related manner. These objectives are:

- To gather information on where public transport is **available** in a city and understand how that availability changes by time of day and by route.
- To gather information from users of different modes on how **acceptable** different means of transport are to different social groups.
- To calculate how **affordable** public transport is in a city.
- To gather information from householders and communities on where parts of the city is **accessible** and understand how that accessibility changes by time of day.
- To gather information from householders and communities on how **acceptable** different means of transport are to different members of the household.
- To gather information from householders and communities on how **affordable** travel to services and employment is in the city.

In order to deliver these objectives, the study developed a methodology that was composed of a series of steps that could be used to gather information using combined methods of GPS and mobile technology and community participation. In this pilot, the mobile phone application, GPS Essentials for Android SmartPhone Operating Systems, was used and the tracks saved were then mapped onto GoogleEarth. The steps of this methodology were:

Step 1 - Use GPS and mobile technology to map and measure public transport routes in the city

Step 2- To measure the frequency of public transport and the waiting times for different categories of people to give an indication of passenger journey times and availability

Step 3 – To gather information on how **acceptable** different means of transport are to different social groups. This information can help us improve the quality of public transport

Step 4-To calculate how **affordable** public transport is in the city using the affordability index method.

Step 5 - To ask householders and communities about how easy it is to access different parts of the city and how does that change with time of day and season

Step 6 - To gather information from communities on how **acceptable** different means of transport are to different social groups.

Step 7- To understand from communities how **affordable** public transport is in the city.

The methodology was piloted in 2 African cities, Nampula in Mozambique and Kigali, Rwanda. Each pilot exercise was undertaken over 2-3 days and involved both mapping and measuring across a selection of the public transport network as well as community discussions with a small number of selected low-income communities.

Set out below are images developed from GPS tracking mapped onto GoogleEarth of informal public transport routes, where maps did not, in some cases, previously exist.

Fig 1. Output from GPS tracking software of some surveyed informal public transport routes in Kigali, Rwanda.

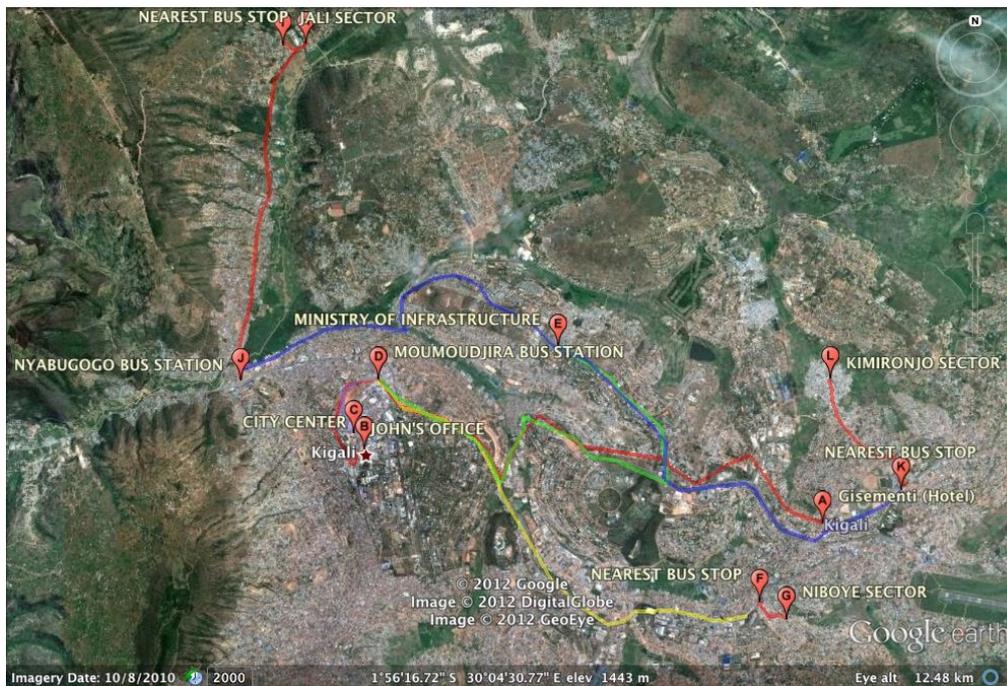
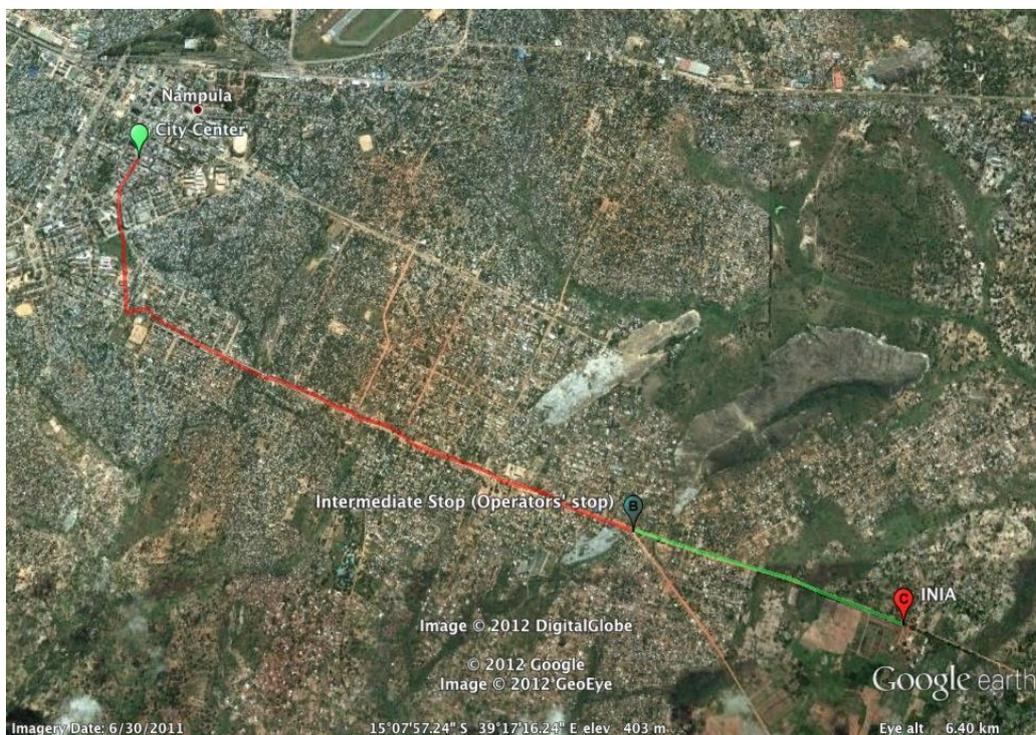


Fig 2. Mapping of Nampula, Mozambique of an informal public transport route (in red) that terminates before its planned destination (where the red tag is).



In addition, selected low-income communities were selected to undertake qualitative household discussions in both the pilot cities (Nampula and Kigali). These highlighted a range of issues, that in the case of the Nampula pilot, the city planning officials were not aware of. For Nampula, it was found that informal public transport (chapas) was terminating short of the official route terminus. This was being seen as a response by some operators of maximising revenue along a route in times of increasing fuel prices. The operators' behaviour had an impact on passengers living in peripheral communities causing them to walk considerable distances and/or paying twice to change onto another operator that would take them all the way, including the extra time needed to step down from one vehicle to another. This behaviour and the extent of it was not appreciated by the city officials until the pilot study.

Furthermore, in Nampula it was observed that at the 'last mile' between the motorised transport services and people's house was almost always undertaken on foot even though for some these were over long distances. Whilst there were newly-developing motorbike taxis spreading across the city, these rarely penetrated neighbourhoods. Lastly, it was observed that many communities were disadvantaged by the lack of any formal access infrastructure of paths, roads or street lighting that prevented many forms of transport to access these communities and made walking difficult and daily routines insecure after dark

5. Conclusions

One of the key objectives of equitable transport planning is the delivery of accessibility, that is affordable, available and acceptable. Yet the accessibility needs specific to the urban poor are rarely incorporated in transport planning, a gap that has wider implications in the renewed planning focus that is occurring in cities of Africa, Asia and Latin America. Furthermore where approaches are made the planning practices often rely on expensive data gathering methodologies that are rarely repeated if undertaken at all. This paper has explored a methodology that seeks to improve the tools available to key stakeholders, including governments, donors and civil society, to identify the specific accessibility needs of the urban poor that would improve equity of planning outcomes and enhance the ability the urban transport sector to contribute to poverty reduction. It has explored a package of methodological approaches to rapid appraisal of accessibility within urban low-income communities. It has explored the scope of new mobile technologies and participatory approaches to deliver user group planning practices and protocols within such communities. It recommends a methodological approach that is worthy of further exploration in other developing cities that may enhance our understanding of and planning for accessibility of low-income communities in developing cities.

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