Indicators of urban poor communities and their accessibility

Indicators of urban poor communities and their accessibility is part of a study on the Development of an Urban Poor Accessibility Assessment Tool

Acknowledgements

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Glossary of Terms

Term	Meaning
Acceptability	The satisfaction people have with the safety, comfort and reliability of everyday journeys around a neighbourhood or city.
Accessibility	The ability people have to reach services, other people and opportunities located in a neighbourhood or across a city within their physical and financial capability, the time they have available and the means of travel available to them.
Affordability	The ability of people to pay for travel from their everyday income.
Availability	The extent to which transport services and mobility are ready to use at the time people want to use them
Indicator	A way of representing the performance of a particular element of the urban transport system by means of single value or number
Urban Mobility	The movement of people, by whatever means, across a neighbourhood or city

1. Introduction

1.1 Purpose of Paper

The purpose of this paper is to provide a clear guide to users of the Urban Poor Accessibility Tool on how to:

- Identify target urban poor communities using indicators
- Easily analyse the information and data produced by the Tool using indicators.

This paper sets out Urban Community indicators by which to assess the characteristics of urban poor communities and neighbourhoods. This is intended to allow some consistency on the selection of communities and neighbourhoods to be targeted by the Tool. It is also intended to enable key urban poor communities with extreme accessibility challenges to be identified and the efficiency of limited assessment resources to be maximised.

This paper also sets out Urban Accessibility indicators that can be used in conjunction with the Urban Poor Accessibility Assessment Tool to facilitate the analysis and presentation of data. The Urban Accessibility indicators' main aim is to encourage the regular and repeated use of the Tool by relevant public bodies over many years. This will enable a picture of the accessibility of urban poor communities to be built even within a context of very limited data gathering resources. The indicators have been proposed to support consistency in the analysis of data that will come from this regular and repeated use of the Assessment Tool.

The indicators will enable changes and trends to be observed and provide some indication of the impact of any changes to access brought about by government, city authority or development agency interventions. The indicators proposed are qualitative in nature as the Tool itself has been developed as a Rapid Assessment process. It is not possible to attribute robust statistical descriptions to the data gathered by the Tool or to the indicators. The causes and further explanation of these changes will, however, require more substantial data collection and analysis. The Urban Accessibility Indicators are not intended to be a comprehensive list of possible indicators that can be developed from the data gathered in the Urban Accessibility Assessment Tool. The choice of any or all of the indicators is at the discretion of the planning and monitoring organisation and they.

1.2 Structure of Paper

The paper initially sets out the indicators for the selection and targeting of low-income communities. The paper then goes on to set out the proposed Urban Accessibility indicators grouped into 3 areas:

- affordability
- availability and
- acceptability

Each of the indicators are hereby explained in more detail together with cross-referencing to the relevant Step in the Urban Accessibility Assessment Tool Manual from which the indicator's data can be gathered. The aim is to enable cross-reference between the paper and the Manual.

1.3 Approach to using the Indicators

The first part of the paper is intended to support the identification of low-income communities with accessibility challenges in a consistent manner. The guidance is intended to be used at the beginning of the assessment process. Guidance on how low-income communities should be identified and the accessibility challenges they face can be used by the Assessment Team to understand which communities can be focused on. It can also be used to assist in deciding how to assign scarce resources across an urban area. The indicators can also be used to ensure that, as personnel responsible for such assessments change over time, consistency as to what low-income communities are assessed can be maintained.

The second part of the paper is intended to set out an approach for analysing and reporting the data gathered by the Assessment Tool.

Once data has been gathered by the Tool there are different ways that the data can be reported. However, there needs to be some consistency each time the Tool is used and the data is reported. Frequently, different Assessment Teams may report the data in different ways using different assumptions and criteria.

One way of overcoming this is to report data in a pre-determined manner in a way that highlights the performance of the urban transport system. The Assessment Tool will be used for an assessment. The data from the use of the Assessment Tool can then be cleaned and collated in order to comply with the definition of the proposed indicators. The proposed indicators enable data to be reported consistently for each use of the Assessment Tool and allow comparisons of changes in accessibility to be made over time.

The indicators in the second part of the paper are intended to be used at the end of the Assessment process. The proposed indicators can of course be amended and added to. The key, however, is that there is agreement on what the indicators are, from one use of the Assessment Tool to another, in order for urban transport system performance to be assessed.

2. Indicators to identify urban poor communities

This section of the paper seeks to identify indicators that can be used to target urban areas where the 'community' parts of the Urban Poor Accessibility Tool can be usefully used.

The UN-Habitat and others have already undertaken a substantial amount of work defining such low-income communities in cities across the developing world. UN-Habitat [1] defines them as areas that lack one or more of the following characteristics:

- **Durable housing:** A house is considered "durable" if it is built on a non-hazardous location and has a structure permanent and adequate enough to protect its inhabitants from the extremes of climatic conditions, such as rain, heat, cold and humidity.
- **Sufficient living area:** A house is considered to provide a sufficient living area for the household members if *not more than three people* share the same room.
- **Access to improved water:** A household is considered to have access to improved water supply if it has a *sufficient amount of water* for family use, at an *affordable price*, available to household members without being subject to *extreme effort*, especially on the part of women and children.
- **Access to sanitation:** A household is considered to have adequate access to sanitation if an excreta disposal system, either in the form of a *private toilet* or a *public toilet shared with a reasonable number of people*, is available to household members.
- **Secure tenure:** Secure tenure is the right of all individuals and groups to effective protection against forced evictions. People have secure tenure when there is *evidence of documentation* that can be used as proof of secure tenure status or when there is either *de facto* or *perceived protection against forced evictions*.

These definitions can be used to select communities for assessment. **In addition**, there are also some further characteristics regarding the relative (in) accessibility of such communities that can be used to select communities. Low-income communities identified, using the definitions above, that also feature one or more of these additional characteristics can be chosen. These characteristics are:

- **Peripheral location relative to the rest of the city**: this may make journeys to reach established services and opportunities
- **New established settlements or settlements of newly-arrived migrant populations**: this may make journeys more difficult for people in these communities as the city authorities or the private sector operators may not have responded yet to the expansion of the city in this direction by providing transport infrastructure or services. Residents may also lack assets such as bikes, motorbikes, carts or vehicles that may be found in more established communities.
- **Lack of access to internal roads and street-lighting**: this may make walking and non-motorised travel difficult, may restrict access for larger vehicles within the community and may make access to services within the community difficult at night, in the rainy season and for women.
- **Lack of access to regular public transport services from either formal or informal operators**: this may make access to services and opportunities in other parts of the city difficult.

These indicators can form the basis on which focus should be placed on certain communities across a city through the Urban Accessibility Assessment Tool. The can be used to inform the

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[1] UN-HABITAT (2007) State of the world's cities Report 2006/7 Earthscan, London

selection carried in **Step 1** of the communities that will be selected for measurement and survey.

One approach would be for the whole Assessment Team using the Tool to work together and categorize and rank all the neighbourhoods for a city using the indicators above. Once this is completed, the Team should agree which communities have the most extreme values in the characterization of Urban Poor communities and their accessibility. As many of these communities can then be targeted for assessment as resources will allow.

It should also be remembered that low-income communities are rarely homogenous in terms of the types of people living there, the income they have and the assets they have access. As result, even once spatial communities have been selected, differences in how people within these communities experience urban mobility should be looked for and recorded.

3. Developing indicators of urban accessibility using the urban accessibility assessment tool.

This section sets out how the urban accessibility assessment tool developed for this project, may be used to provide data for a small number of indicators of accessibility for the urban poor and what those indicators may be. Then each proposed set of indicators is explored in turn.

Carruthers et al[2] and others at the World Bank have highlighted the development effects of an urban transport system in terms of:
- o Affordability
- o Availability and
- o Acceptability

They argue that as a result there should also be indicators that report the performance of urban transport systems in these terms. However, it is difficult to assess accessibility for low-income communities using one or small set of indicators. The research required to assess the robustness of any one indicator has not yet been done. Furthermore, as set out in the urban accessibility tool, urban transport planning in most developing contexts lack the basic level of data to be able statistically assess robust indicators. As a result, this paper sets out some qualitative indicators that may be used with the Urban Accessibility Assessment tool and if built upon over a period of time can provide a robust picture of urban transport system performance. The proposed indicators are:

Affordability of Mobility	1.	Percentage of the poorest 10% in the city for whom a urban transport system is affordable (requiring less than 10% of monthly household expenditure) **(STEP 7)**
Availability of Urban Mobility	2.	Percentage of the population who can access to key services in 30 minutes from your home for different social groups and different times of day/night **(STEP 5 & STEP 6)**
	3.	Distance travel to reach nearest bus stop (km/miles) **(STEP 2 &STEP 5)**
	4.	Average waiting time at bus stops (minutes / hours) for different time of day and for different social groups (men, women, children and older people) **(STEP 4)**
	5.	Average frequency of buses serving the same route (minutes/hours) for different times of day & night **(STEP 4)**
Acceptability of Urban Mobility	6.	Average ratio of the number of passenger to vehicle capacity by different times of day/night **(STEP 3)**
	7.	Percentage of services that terminate early by different times of day or night **(STEP 3)**
	8.	Average additional cost to passenger of travelling with loads **(STEP 5 & STEP 7)**
	9.	Is it safe to walk around a neighbourhood (YES/NO) for different social group and for different time of day and night (**STEP 5 & STEP 6)**

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[2] Carruthers, R.; M. Dick and A. Saurkar (2005). Affordability of Public Transport in Developing Countries. World Bank Group Transport Sector Board. January. Washington DC: World Bank Publications.
http://siteresources.worldbank.org/INTTRANSPORT/214578-1099319223335/20460038/TP-3_affordability_final.pdf

3.1 Affordability indicator

Affordability of Urban Mobility	Percentage of the poorest 10% in the city for whom a urban transport system is affordable (requiring less than 10% of monthly household expenditure)

An affordability indicator that measures the percentage of average household income that has to be spent on urban mobility is a reasonable indicator for the performance of an urban transport system and connects to a long running discussion on the affordability of urban transport in developing countries. The data for this can be collected from the urban accessibility assessment tool for the communities identified **(STEP 7)**.

One approach was developed by the World Bank nearly 10 years ago and is called affordability index. The index also has at its core the idea that affordable urban transport is where households spend less than 10% of their household income on transport[3]. In order to calculate how **affordable** public transport is in the city using the Affordability Index[4] is relatively simple, and the data for its compilation is relatively easily available even in context that lack many elements of the transport data:

$$\text{Affordability Index} = \frac{\text{Number of trips x Average cost per trip}}{\text{Per capita income (Average or Bottom Quintile)}} \quad \text{expressed as a \%}$$

In order to calculate it you need to:

- Find the average per capita monthly income and the average for the bottom quintile of the income distribution;
- Determine the minimum public transport fare to travel 10km using a daily ticket
- Calculate the cost for 60 trips at this fare;
- Express this cost as a per cent of the average and bottom quintile monthly incomes.

However, there are 2 issues that need to be considered in adopting this indicator. Firstly, an average value for this indicator across a whole city may mask significant disparities and inequalities that should be addressed by any indicator that seeks to drive the efforts of the development community. As a result any indicator should have the capability of focusing on the inequalities in affordability across a city.

As a result it is suggested that a focus should be placed on the poorest and the wording for the indicator may be the '***percentage of the poorest 10% in the city for whom a the urban transport system is affordable ((requiring less than 10% of monthly household expenditure)***'

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[3] Armstrong-Wright, Alan.(1986) *Urban Transit Systems: Guidelines for Considering Options.* World Bank Technical Paper 52,. World Bank, Washington, DC. http://wwwwds. worldbank.org/servlet/WDS_IBank_Servlet?pcont=details&eid=000178830_98101904164939

[4] Carruthers, R.; M. Dick and A. Saurkar (2005). Affordability of Public Transport in Developing Countries. World Bank Group Transport Sector Board. January. Washington DC: World Bank Publications. http://siteresources.worldbank.org/INTTRANSPORT/214578-1099319223335/20460038/TP-3_affordability_final.pdf

Furthermore, in many developing cities, particularly in Africa, the poorest (e.g. women, children, older people (even within richer households) and new migrants on the periphery of cities) are often so income-poor, that they are almost entirely reliant on walking as a means of urban travel (and hence have no transport expenditure) so any efforts to improve the affordability for the average city dweller may not affect this poorest group. It is thus questionable in these circumstances that an affordability indicator **on its own** will deliver the objective of efficient urban transport for all, in order to deliver economic growth.

Others[5] highlights that the value for the household transport expenditure and hence the affordability travel is dependent on not only the city and country economic context but also how the question is asked. If questions about how people travel is used, then this method always report that the poor spend a greater % of their income on travel. By contrast, household expenditure and consumption surveys that look at all things a household buys, often report that the higher the household income, the higher percentage spent on travel. There may be a range of factors that explain these contradictory results including:

- the differing focus on expenditure and income;
- an overestimation of small frequent payments for public transport and
- under-estimation of major expenditure on personal vehicle travel in travel survey based methods.

Furthermore, Turner[6] and others[7] have also highlighted the challenge of taking average household values of income, expenditure or travel demand, particularly amongst low-income communities, where it is clear that women and men do not have equal access across a household to financial or time resources to travel, such as private vehicles and fares for public transport.

As a result, Assessment Teams should seek to explore asking about the cost of travel with householders and communities in different ways. If the information is to be collected regularly, there needs also to be consistency between time periods of data collection.

The Urban Accessibility Tool also needs to collect travel expenditure data from many different members of the household and not just rely on the head of household. It may also be necessary to collect examples of affordability for different social groups (e.g. older women, young people and people with disabilities). It is also good practice to report this indicator and all subsequent ones for men and women separately as well as for different social groups (e.g. older people, people with disabilities and younger people).

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[5] Diaz Olera, L., Plat, D. and Pochet, P. (2008) Household Transport Expenditure in Sub-Saharan African cities: measurement and analysis. Journal of Transport Geography Vol 16, No 8. Pp 1-13

[6] Turner, J. (2012) Urban mass transit, gender planning protocols and social sustainability; the case of Jakarta *Research in Transportation Economics* Vol 34 pp 48-53

[7] Turner J. and P.R. Fouracre (1995) Women and Transport in Developing Countries *Transport Reviews* 15(1) pp 77-96

3.2 Availability indicator

Objective	Proposed Indicator
Availability of Urban Mobility	• Percentage of the population who can access to key services in 30 minutes from your home for different social groups and different times of day/night • Distance travel to reach nearest bus stop (km/miles) • Average waiting time at bus stops (minutes / hours) for different time of day and for different social groups (men, women, children and older people) • Average frequency of buses serving the same route (minutes/hours) for different times of day & night

An urban transport system in a developing city needs to deliver access for all to services, employment, economic opportunities and social networks. There is therefore a need for an urban transport system performance indicator that focuses not only on 'affordability' but also on 'accessibility'. It is the ability to access basic services (education, health centres, markets, family networks) and employment within a certain period of time that will ultimately deliver developmental impact. This delivery can be facilitated by moving people or by bringing services to people or more importantly a combination of both.

A very useful indicator that could drive real developmental impact in developing cities, particularly in Africa, would be an indicator on that is worded '**percentage of the population who can access key services and opportunities in 30 minutes from their homes**'. This indicator can also be used to reinforce the focus on low-income communities by focusing on the **percentage of the lowest 10-20% of the population** who can access key services within 30 minutes. Key services in this case, would be hospitals, secondary schools, workplaces, markets. A valid indicator can be calculated for each key service. This would also be a valid indicator whether the service is within the neighbourhood or across the city.

The urban accessibility tool provides a method of measuring and surveying accessibility issues for selected communities. It does this by the community and household surveys it sets out and their focus on mapping access to key services for different social groups at different times of day and night **(STEP 5)**. Furthermore, the urban accessibility tool provides methods by which the availability of mobility can be assessed for communities and social groups. It also provides an ability to assess availability for different social groups and for different times of day. The tool supports the gathering of data for:

- **waiting times (for different groups and different times of day) (STEP 4)**which can be averaged across all the stops surveyed as an indication or for a particular stops for a particular low-income community in order to enable comparisons over time to be made.
- **frequency of service (for different groups and different times of day) (STEP 4)** which again can be averaged across all the stops surveyed as an indication or for a particular stops for a particular low-income community in order to enable comparisons over time to be made.
- **Distance travel to reach nearest bus stop (km/miles)** which can be calculated using the Urban Poor Accessibility Assessment Tool from the GPS plots or community mapping undertaken within the selected low-income communities **(STEP5)**. This can be calculated as an indication only for those low-income communities that have been selected for community and household surveys. Furthermore, with the development of a GPS public transport map **(STEP 2)**for a whole city or parts thereof, as described in the Urban Accessibility Tool, it would also be possible to calculate, using GIS the average

distance from public transport routes to the centre of a neighbourhood. This would provide a figure the whole of cities, but would still be supported by on the ground surveys with communities.

The Assessment Tool allows for the gathering of data on a range of different social groups. It is always good practice to report the values for the indicator for men and women separately as well as for each of different social groups (e.g. older people, people with disabilities and younger people).

3.3 Acceptability indicators

Objective	Proposed Indicator
Acceptability of Urban Mobility	• Average ratio of the number of passenger to vehicle capacity by different times of day/night • Percentage of services that terminate early by different times of day or night • Average additional cost to passenger of travelling with loads • Is it safe to walk around a neighbourhood (YES/NO) for different social group and for different time of day and night

The perceived safety, quality and acceptability of different means of transport is crucial to the decisions people make over how, where and when they travel. Qualitative data collected by the passenger interviews described in **Step 3** of the Urban Accessibility Assessment Tool provides a rich source of information for service providers and city managers. It is useful to capture this richness in an indicator to allow for monitoring of the performance of the urban transport.

STEP 3 of the Assessment Tool gathers a whole series of opinions about different walking or public transport route. It is possible to summarise the data for different social groups simply in a table such as this, for either each route or grouping routes by the communities assessed.

	Formal Transport	Informal Transport	Bike/Motorbike/ shared taxi
Men	+	-	++
Women	_ _	_ _ _	+
Young People	_	_ _	_
Older people	+	_ _ _	_

Key:
+ positive
++ very positive
+++ extremely positive
Φ not positive or negative
_ negative
_ _ very negative
_ _ _ extremely negative

Table 1: Example of table to indicate acceptability of different urban transport for different social groups

The Assessment Team should also be able to attach comments and direct data from people that have been interviewed to support their qualitative assessment of acceptability in the above table.

Furthermore, it is possible to develop discrete indicators from the data gathered from passengers, communities and householders on the acceptability of the urban transport system. We suggest 4 indicators from the Urban Accessibility Assessment Tool. These are:

- **Average ratio of the number of passenger to vehicle capacity by different times of day/night (STEP 3)** which can be developed from a qualitative assessment of how crowded or overcrowded a vehicle or walking route maybe from the view of the Assessment Team member. This indicator can be developed for a route, or for services serving a selected low-income community. Reporting the indicator for different social groups should be considered

- **Percentage of services that terminate early by different times of day or night (STEP 3)** again can also be developed from a qualitative assessment of the number of times that the services used by the Assessment Team terminate their journey early. This will vary by time of day and again it is not possible to gather a representative picture of this, but can provide an indication of the scale of the problem on either a particular route, for a particular selected low-income community or for travellers at a particular time of day

- **Average additional cost to passenger of travelling with loads (STEP 7)** which can be developed from household interviews of load carrying practices. This can be reported as an average for the selected low-income communities or for all the communities surveyed. Reporting for different social groups should also be considered where differences are found.

- **Is it safe to walk around a neighbourhood? (YES/NO)** This can be reported for different social groups and for different time of day and night. This indicator can be supported through the community and household elements of the Urban Accessibility Assessment Tool **(STEP 5 & 6)**. Whilst the Tool will generate a range of responses from communities and individual people, it may be possible to make a qualitative assessment of the overall safety of a neighbourhood for travel and when and for whom this varies. The detailed results of the personal security elements of the Tool should be recorded to support this qualitative assessment and as this Tool is used repeatedly over time it may be possible to determine how perceptions have changed.

The Assessment Tool allows for the gathering of data on a range of different social groups. It is always good practice to report the values for the indicator for men and women separately as well as for each of different social groups (e.g. older people, people with disabilities and younger people). An example of such separate reporting is shown in Table 1.

4. Conclusions

This paper is intended as an additional resource to be used alongside the Urban Accessibility Tool. It sets out the factors to consider when deciding which low-income community to assess and study. It provides guidance on how scarce assessment resources can be targeted. It also provides consistency in the selection of the urban poor communities over time.

The paper also identifies a series of indicators around affordability, availability, accessibility and acceptability or urban transport to assess the performance of a city's transport system for the needs of low-income communities. It supports the use of the Assessment Tool on repeated occasions over the long-term, by setting out consistent indicators that analysis can be focused on. It allows for internal consistency in data reporting and allows for the assessment of trends over time. The choice of any or all of the indicators is at the discretion of the planning and monitoring organisation. They are not intended to be a comprehensive list of possible indicators that can be developed from the data gathered in the Urban Accessibility Assessment Tool.

In addition, the indicators can be used to present data to decision-makers in an understandable and transparent manner. They can also be used to monitor changes and trends in access in particular low-income communities. They can also be used to assess impacts on low-income communities that have been subject to government city authority or development partner intervention. In addition, they can be used to highlight areas for effective use of more substantial monitoring and evaluation resources.

Rapid, regular and repeated use of the Urban Accessibility Tool in conjunction with these indicators will develop an internally consistent picture over time. However, the Assessment Tool is intended as a rapid assessment tool and is not designed to provide substantive statistically robust assessments of urban transport system performance. The proposed indicators should be assessed in the same manner. They are instead designed to highlight areas of further more substantive investigation in order to improve the access of urban low-income communities.

UN@HABITAT
FOR A BETTER URBAN FUTURE

United Nations Human Settlements Programme (UN-HABITAT),
P.O. Box 30030, GPO Nairobi 00100, Kenya.
Tel: +254 20 7625288; 7623668
Fax: +254 20 7623588
E-mail: advocacy@unhabitat.org
Web: http://www.unhabitat.org