

THE CONCEPT OF AFFORDABILITY OF URBAN PUBLIC TRANSPORT SERVICES FOR LOW-INCOME PASSENGERS

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The concept of affordability is widely used when discussing urban public transport fares in the presence of low incomes and poverty, but it is not universally accepted as being meaningful.

Fare is the dominant feature of public transport services for low-income travelers. Likewise, it is the key policy variable for both the operating companies and for the government, local and even national. As passenger incomes increase, concern over fares starts to be displaced by the concern for quality. Traveler reactions to fare increases or decreases are of major interest to operators of transport services, since they affect patronage therefore revenue. This aspect is captured by a standard economic notion of price elasticity, with an established definition, measurement methods, and interpretation.

When a fare increase leads to a loss of passengers at the low end of the income scale, the operator is concerned because of the loss of revenue, but not more than that. Understanding the concept and having some knowledge of the values of price elasticity in this context is necessary for the operator to make informed decisions about setting tariffs (sufficiency includes a requirement to know also about costs).

Affordability refers to the same context, but the concern is different and from a different point of view. It is a concern of the society for its least privileged members. When a fare increase could lead to a loss of poor passengers, and the alternatives are few and inferior, access to jobs and services may be reduced, and social interaction may be affected. This chain of events may lead to social and economic exclusion of those at the bottom of the income ladder. This chain of events needs to be taken into account when tariff changes are being considered. So concerns about affordability are clearly nested in the larger subject of poverty impacts of transport policy.

The debate about the meaning and usefulness of the concept of fare affordability can be presented by stating the polar positions. Given that we are concerned about the social impacts of the policies that we recommend, the polar minimalist position is not to consider only the impacts on the revenues of the transport operator through the operations of price elasticity. It is rather to treat affordability as an important measure of transport system performance.

An affordability index could be defined as the fare expenditure made by a household as a percentage of its income. The index would be computed for various income groups and the results scrutinized with an open mind as to whether, using the evidence of the proportion on income spent on fares, they are reasonable, high or onerous. The knowledge of affordability indices for the same city at some other point in time, or for other cities in the same country or elsewhere, may provide a useful basis for comparison.

Such comparisons can only be made with much caution, since the *ceteris paribus* assumption cannot be made.

At the other end of the range, the approach could be to specify affordability norms to guide policy action. A standard and often cited statement of this approach comes from Alan Armstrong-Wright and Sebastien Thiriez, "Bus Services - Reducing Costs, Raising Standards", World Bank Technical Paper No. 68, The World Bank, Washington, DC, July 1987:

“Travel expenditure probably is perceived, particularly by low-income groups, as the most important criterion in their choice of mode and may lead many to choose to walk. The extent to which a bus service is affordable is dependent on the income level of the users. In developing countries, a reasonable level of household expenditure on bus travel should not exceed 10 percent of household income..... In industrial countries , households without cars may spend in the region of 3-5 percent of their incomes on commuting. In developing countries, at the other extreme, studies have found that certain very low-income groups may spend in excess of 30 percent of their income on travel (Nairobi, Sao Paulo), while levels of expenditures in the region of 15 percent are not uncommon (e.g., Kingston, Jamaica; Calcutta, etc.).”

Whether or not the authors meant for the 10% reasonable ceiling to become a norm, it has been treated in this manner by many professionals and by some local governments. In many cases it is not necessarily this particular index value (10%) or any index value, but rather the idea that there is some limit to what is an affordable fare. In these cases the norm is not expressed in terms of an index value, but as some absolute level of fare produced by the political process or chosen arbitrarily by someone in the decision making process. In a few cases the norm is applied as the level beyond which subsidies are applied, as with the *vale-transporte* program in Brazil. In this case when fare expenditures exceed a given percentage of the disposable income of an employee (typically six per cent) , the subsidy is applied.

This normative approach is not limited to urban public transport. The same concept underlies the consumer basket commonly used to track price levels and household subsidies used in Russia and China, and the entire basic needs approach to poverty calculations.

While the minimalist approach to use of an affordability index has limited use in informing policy advice, the many difficulties of the normative approach in urban transport are given in *Cities on the Move: a World Bank Urban Transport Strategy Review*, The World Bank, Washington, DC, 2002. In summary:

There are wide variations in proportion of income used for public transport services by low-income households, reflecting different tradeoffs in the choice of residential location and employment.

Fare may be the most important aspect of public transport services for the low-income travelers, but this is not to the exclusion of other service parameters. Low-income people are known to pay. This also contributes to variations in modal choices by low-income travelers and in related expenditures.

These variations imply that the concept of “affordable fare” cast as a ceiling and used for fare regulation has no basis and should be discarded. Instead, the fare setting process should include demand forecasting coupled with subsidy forecasting.

Cities on the Move: a World Bank Urban Transport Strategy Review, The World Bank, Washington, DC, 2002

A reasonable approach is to continue using affordability indices as valuable indicators of transport system performance, useful in identifying problems that need to be looked at in more detail. Lest this be thought too modest, it should be remembered that measures of affordability may have some explanatory power but no predictive power, in contrast to elasticity. Indeed, when the impending decision by a local government concerns the level of fares to be inserted in a concession bid document, or even when there is a fare increase being considered, it is well advised to take a cautious and much more analytic approach.

The affordability index was defined above in terms of actual spending for public transport services and actual incomes (or total expenditures) by households.¹ Whether to use household expenditure or income as the denominator in the Index depends on what the Index is being used for (see later for a summary of the reasons for using income rather than expenditure)

The empirical approach based on expenditure requires a sample drawn from a target population, obtained through travel and/or expenditure surveys and generalized over the population. The results are distributions that reflect actual travel experiences, including a full range of coping strategies at the low end of the income scale. One drawback is that surveys are costly and take time to do. The explanatory power of this index alone is low, due to the multivariate nature and complexity of the underlying behaviors. Problems therefore may arise in interpreting the results. For example, a low value of the Index in the lowest income deciles may mean that transport services are provided at such commendable efficiency that prices are satisfactory from low-income point of view. Or it could mean that fares are so onerous that low-income travelers walk or take some other mode. The approach to follow is to analyze affordability data together with other measures of household economics and the transport system performance, including further interviews, to get a better sense of what is happening.

¹ The question whether to use income or expenditures in the denominator of the affordability index is not dealt with in detail here.

Problems of interpretation limit sharply the use of empirical affordability indices for out-of-city and out-of-country comparisons, short of some form of category analysis to eliminate the impact of essential local features such as the urban structure, transport alternatives available, the regulatory arrangements, cost recovery policy, and price/subsidy aspects for other essential goods and services.

An alternative to using data from travel and expenditure surveys to compile affordability indices is to “synthesized” the data on fares and number of public transport trips based on assumptions about household type and travel scenarios. A common scenario is to postulate a 4-member household, with one or both adults employed and one child making a school-related trip beyond walking distance. Fare expenditures are estimated for trips at average and extensive lengths, say 5 and 10 km. Income data are drawn from surveys, if available, otherwise some milestone wage is used, such as minimal wage or average per capita income.

The advantage of the “synthetic” approach is that the needed data can be collected relatively easily and at low cost. Also the assumptions are explicit and few in number, and the information value of the resulting Index can be quite high. This approach is well suited for diagnostic studies, and even as a complement to empirical studies. Finally, the synthetic affordability index is more portable than the empirical one, since the same household and travel scenarios and the same income milestones (e.g. the minimum wage) can be used elsewhere. Index values compiled from different cities are more easy to compare than those based on actual expenditures.

The above discussion should not be seen as favoring the empirical or synthetic approach to computing affordability indices. The synthetic indices should be calculated whether or not the surveys will be or have been done.

Affordability Indices are computed with an idea that ultimately this may be linked to improvements for low-income and poor people. Indeed, in the urban transport planning and regulatory context, especially in large cities with long travel distances for home to work travel, the presence of onerous and/or unaffordable public transport services calls for some form of corrective action.

In the most narrow frame, the corrective action focuses on PT fares, be this their magnitude or structure (relation to distance and/or travel time, treatment of transfers).

A wider approach could involve adding at least the following dimensions:

- (1) organization and regulation on the supply side, affecting total operating costs of providing UPT services and the quality of service; since economic and financial requirements of transport companies have the largest bearing on fares (needed fare revenues) affordability can be increased considerably through non-fare action.
- (2) non-price features of UPT services, such as availability, travel speed, punctuality, reliability, comfort (including crowding, seat availability, climate control), safety

- and security. Various segments of the travel market (e.g. grouped by income and trip purpose) value the cash price and non-cash service parameters differently.
- (3) The subsidy policy, subsidy management and the government capacity to pay.
 - (4) A full modal choice context in a given city, i.e. a sense of transport alternatives available in addition to public transport services. If UPT services are not affordable, how are these other alternatives and can one do something to improve them?
 - (5) A full household income and consumption picture. Transport is only one of goods and services deemed essential by households. The available budget has to be divided among housing, food, energy, etc., with substitutions and trade-offs determined by household- and city-specific characteristics.

The work undertaken in the last year by the World Bank on affordability has been limited to constructing an Affordability Index and estimating its values for twenty seven cities. We are now calculating the values for more cities, and looking at the range of options for making urban transport more affordable to those on low incomes, and looking at experience in applying them to see what conditions are needed to make them work efficiently. Two important lessons learned from many efforts to make urban transport affordable is that subsidies generally have a very high “leakage” so that most of the advantages do not go to those who really need them, and that unless a subsidy has a reliable and sustainable funding mechanism, the negative impacts on the transport operator can more than outweigh any benefits to poor passengers.

“Fares unaffordable to passengers should not be replaced by subsidies unaffordable to the fare setting institution”.