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**Improved Accessibility to Essential Utilities – A Critical Need for
Communities of Emerging Asia**

(Background Paper for Plenary Session 3 of the Provisional Programme)

Final Draft

This background paper has been prepared by Mr. Peter O'Neill, Mr. Madan B. Regmi and Ms. Shan Wang, for the Eighth Regional EST Forum in Asia. The views expressed herein are those of the authors only and do not necessarily reflect the views of the United Nations.

Improved Accessibility to Essential Utilities

A Critical Need for Communities of Emerging Asia

ABSTRACT

Millions of people in Asia lack access to market, schools, hospitals and other essential utilities and services that hampers national productivity and social-economic development in this region. The paper focuses on the accessibility issues faced by two of the most vulnerable groups—the rural population and those who have been referred to as the urban poor in the context of emerging Asian countries. By examining the current statuses and main accessibility challenges respectively, some policy recommendations are drawn to help promote improved accessibility in these communities.

KEYWORDS

- **Accessibility**
- **Rural Communities**
- **Urban Poor**
- **Social-economic Development**
- **Developing Countries**
- **Asia Pacific**

BACKGROUND PAPER FOR THE PLENARY SEESION 3, 8th EST FORUM

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This paper is issued without formal editing.

1. Introduction

The inadequacy of adequate transport or access persists as a major obstacle that constrains the social-economic development of developing Asian countries. This issue intensifies itself particularly within two groups: those who live in the remote rural communities and those who have been considered as urban poor.

Access is an important factor in rural development. People need to have adequate access to water, energy, land, health services, education, transport services and markets. A lack of access limits the opportunity that people have to improve and sustain their social and economic well-being. Improving access and reducing poverty are correlated. A lack of access is perceived as one of the main underlying factors of poverty in rural areas in developing countries.

Although the word 'crisis' has been used to describe transport problems in European and American cities, the term seems far more appropriate for cities of the developing world. Among the elements that contribute to the 'crisis', the transport issue faced by the urban poor cannot be ignored, especially in rapidly growing Asia cities.

The transport problems of the urban poor have been highlighted in past literature. Nevertheless, neither the connections nor inter-relationships between poverty and urban transport (Hook, 1998), nor the distributional impacts of urban transport projects are well understood. Although equity (fairness) is often cited as a concern in transportation decisions, it has in fact received little research (Litman, 1996). This is an indictment and action is needed to remedy it. The crucial role of transport in the quest for sustainable human settlements and improving the lives of those living in poverty has now been acknowledged, however, much remains to be done to translate good intentions into practical initiatives that make a difference to the lives of people living in poverty in the urban areas.

The ambition of this paper is to, firstly, present the current status of the accessibility in the context of emerging Asian communities; secondly, discuss issues and challenges of improving or providing transport/access; thirdly, provide some empirical evidence and good examples of social-economic benefits of improving or providing transport/access; and lastly, propose some policy recommendations for promoting the development of accessibility in a sustainable manner. This work will be based on data and information collected to analyze the transport issues and challenges faced by the rural population and urban poor

Following the introduction, part 2 presents a brief literature review on the subject of accessibility and its relationship with social-economic development. Part 3 discusses the accessibility problems faced by rural communities, provides good examples of how the improvement in accessibility in rural areas can translate into social –economic development before draw some key policy recommendations for

tackling these challenges. Part 4, on the other hand, focuses on the transport issues observed among urban poor in Asian cities, reorganizes the characteristics and challenges, proposes some policy initiatives for enhancing urban poor accessibility. Part 5 concludes the paper by addressing the findings on accessibility problems faced by the urban poor and rural communities, and summarizing main policy recommendations.

2. Accessibility and Development

When assessed from different perspectives, the definition of *Accessibility* slightly varies. In the context of this paper, *Accessibility* (or just *Access*) refers to the ease of reaching goods, services, activities and destinations, which together are called *opportunities*. It can be defined as the potential for *interaction* and *exchange* (Hansen, 1959; Engwicht, 1993). For example, grocery stores provide access to food. Paths, roads and airports provide access to destinations and therefore activities (also called *opportunities*). Accessibility can be defined in terms of *potential* (opportunities that could be reached) or in terms of *activity* (opportunities that are reached). Even people who don't currently use a particular form of access may value having it available for possible future use, called *option value*.

If defined as the ease with which goods can reach other places, measured in terms of time, cost, seasonality, and transport services provided (Halden, 2002; Reneland, 2004), then the definition can be used as an analytical tool to analyze the effects of improved accessibility. Transport services, the ease with which a place can be reached is low where transport services are poor in terms of departure choice, number of operators, modal choice, regularity, and affordability.

Despite its primacy to human activities, however, many transportation analytical methods and technologies neglect accessibility and instead focus on measuring or maximizing system throughput. While throughput is related, it is peripheral to the true objective of transportation that is, maximizing accessibility to opportunities in the environment. As noted by Moseley (1979), however, the rural problem is not primarily related to fare costs or time budget, but essentially to whether a trip is possible to perform at all. Vickerman (1998) argued that a measure of accessibility emphasizing aspects of choice is more likely to represent a genuine measure of economic welfare, especially when applied to individual economic actors and/or regional economies, than will simple measures of accessibility to a region.

Direct effects in the form of improved accessibility are gauged by measuring changes in travel time, fuel and maintenance costs, vehicle load capacity, seasonality and delivery delays. The theory is that a road improvement will lead to direct effects in the form of reduced journey time, reduced costs and improved reliability. The benefits from these effects will in particular be passed on to previous road users, passengers and companies. The indirect effects considered are changes in investment, production system and productivity, employment, market

area, transport service supply, and competition, and how these influenced incomes. Accordingly, the indirect development effects are changes that are stimulated by the direct effects.

As to the relationship between the direct and indirect effects; the direct effects enable the reorganization of production, influence land use and market area, allow improvement to productivity and can stimulate investment and employment. Furthermore, increased productivity through reduced trade costs enables economies of scale, and as interaction costs between regions decrease, trade can increase so that each region can make better use of its advantages and allocate resources more efficiently. Eventually, overall average productivity increases in all regions. As viewed from a slightly different perspective, Garrison and Souleyrette (1996) theorized that transport improvement stimulates and enables, rather than creates, innovations outside the transport sector, as it allows old things to be done in new ways and new things to emerge. In turn, these companion innovations drive social and economic advances. As pointed out by Lakshmanan and Chatterjee (2005) that long-term changes in scale, composition, and location of economic activities induced by transport investments are more like development effects than growth effects. Development implies a structural shift, where a new social and technical environment or a new set of economic opportunities emerges, and the pattern of relationships between the environment and social actors changes. Likewise, increased competition among producers arising through reduced transport costs will theoretically benefit the entire society through lower trade costs and consumer prices, as well as improved productivity, technology transfer, and information flow. These are key to the wider (indirect) economic benefits stemming from improved transport infrastructure (Peters, 2003).

Figure 1 below summaries both direct and indirect effects in the form of improved accessibility and how the effects correlate with each other.

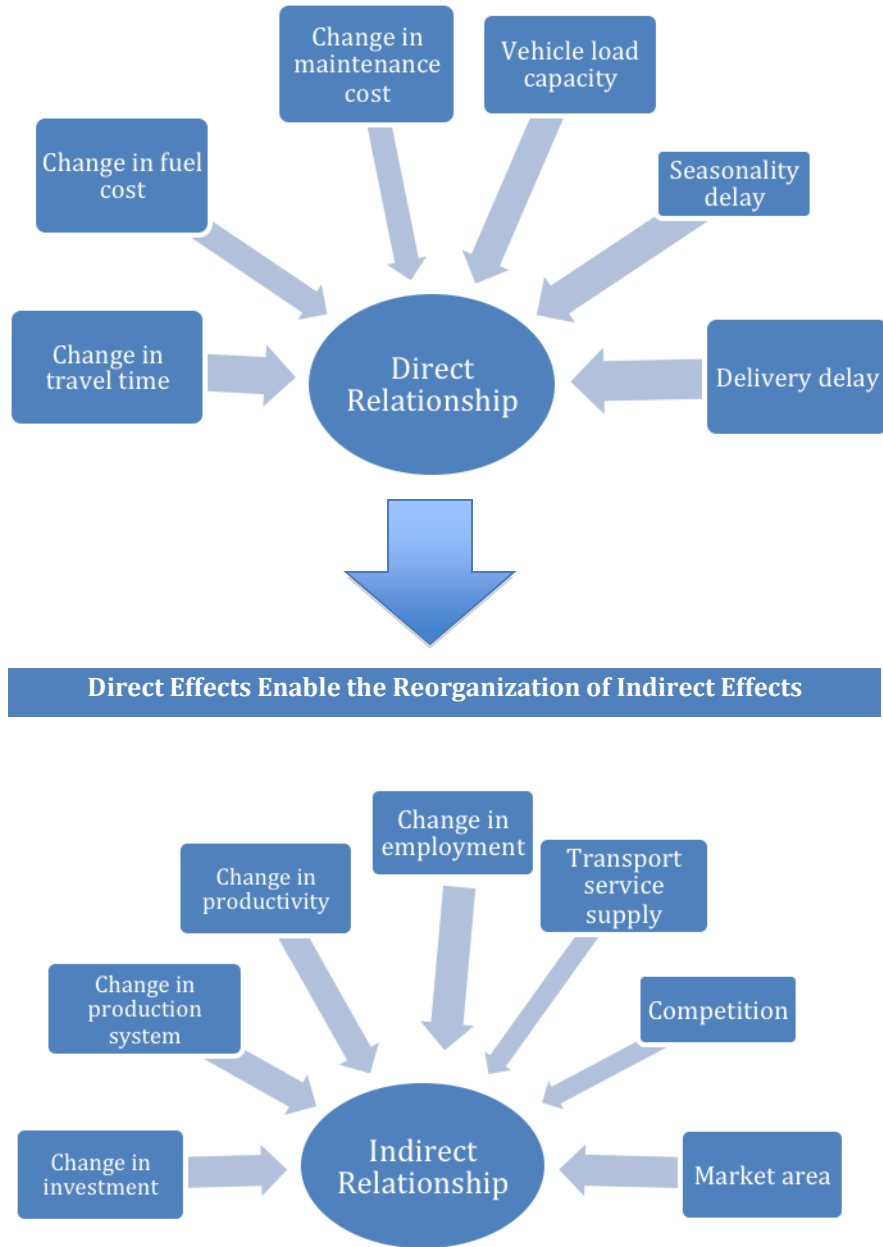


Figure 1: Direct and Indirect Effects in the Form of Improved Accessibility
 Source: Self-elaborated

3. Accessibility: Rural Communities in Emerging Asia

3.1 Current Status and Main Issues

The scarcity of access to essential utilities and services in the rural areas of the emerging Asian communities has been commonly accepted as one of the major constraints in achieving better well-being of the rural population as well as social-economic developments of the rural areas. Transport provide the opportunity to travel, it has the potential to form mobility, which is one element in the provision of access. Lack of access means isolation, which is a key characteristic of poverty and sometimes incubate unwelcomed attitudes and beliefs. Being isolated does not just mean being remote, rather, it means being cut off from supplies, services, facilities and even ideas, it can also harbour unwanted social practices. The existence or absence of accessibility defines the opportunity the rural people have to improve their social and economic well-being.

3.1.1 Lack of Physical Access

It is reported that physical access in the rural areas of developing Asian communities remains a general problem. In some countries, 30% to 40% of the villages are without all-weather road access and a minority has no access at all. In others, many road connections between the capital city and provincial capitals are unpaved and large percentages of provincial roads remain unpaved and may be impassible during the rainy season. In Lao PDR, for instance, road connection between Vientiane and some provincial capitals remains an issue. Roughly half (47%) of the national road network and almost all (96%) provincial roads remain unpaved, and much of it is impassible during the rainy season. More than half of all district centers do not have year-round access by road, and almost one sixth are inaccessible by road at any time (Nogales, 2004). Fig. 1 presents a typical remote rural community in Thailand with limited rural tracks that connect it with the outside world. The provision of transport infrastructure and services in the rural areas in Bhutan, on the other hand, is costly, as transport demand is weak, and many still live with more than half a day's walk to the nearest road (World Bank, 2004)



Figure 2: A Typical Remote Rural Community in Thailand

(Source: <http://newsoffice.mit.edu/2014/how-health-care-plan-quickly-lowered-infant-mortality-0430>)

3.1.2 Road Maintenance

Even if sufficient funds are allocated to construct all-weather rural roads, a fundamental problem in many cases is that rural roads are not properly maintained. Far from building up a productive asset in the form of a viable rural network, and if for instance, roads were not maintained in rainy seasons, additional work becomes necessary, and therefore increases the already overburdened maintenance system with requirements for expensive repairs. For example, despite the high levels of investment, the road network remains under-developed and in poor condition in Lao PDR. Most of the provincial and district road networks consist of tracks that are impassable during the rainy season. More than half of all public investments in the 1990 - 1995 period were used for rehabilitation and upgrading of roads. However, the road sections that were improved or built during the first half of the last decade deteriorated at a faster rate than expected, due to insufficient and inadequate routine maintenance and overloaded trucks (Nogales, 2004).

3.2 Social-economic Benefits of Improved Accessibilities

Particularly, there has been renewed interest in the relationship between transport and poverty reduction. Listed in Box 1 below are some of the negative impacts on education, employment and economic activities stemming from lack of accessibility in the rural areas. Due to its distinctive impacts on rural communities, the issue has received wide attentions and as a result, projects have been launched with the

intention of reducing poverty and promoting social-economic developments. For example, over US\$1 billion of International Development Association (World Bank's fund for the poorest countries) funding goes into rural roads each year. Projects completed in the last eight years have built, rehabilitated or maintained some 240,000 km of roads—with the resulting improvements benefiting over 75 million people.

The following examples from different Asian countries reconfirmed the positive relationship between improvements in accessibility and socio-economic developments in the rural areas.

- Farmers are reluctant to grow a marketable surplus second crop because it cannot be sold or because the difficulty and expense of transport significantly reduces the returns for their efforts
- Agricultural productivity is low and there is a lack of innovation because extension information and inputs do not reach farmers
- School enrollment is low and absenteeism is high
- Standards of health are low because clinics are hard to reach and health workers cannot travel easily

Box 1: Examples of Impacts on Rural Population Due to Lack of Accessibility
(Source: ILO, 2007)

3.2.1 The Philippines

Olsson (2009) conducted a case study on the influence of a 63km road project in a Philippine fishing village named Dinahican. The area has a long history of being peripheral due to poor transport conditions. It is only accessible by land via one road and is located far from its major market Manila (155 km). The area's accessibility was very poor before the implementation of the Famy-Infanta road project in 1995, when the road underwent considerable improvements, with the road being paved with asphalt and its condition improved from bad/very bad to good (ADB/DPWH, 1998). Findings suggest both distinctive direct and indirect effects after the project:

- Both vehicle operating costs and travel time decreased considerably
- Fuel consumption declined, on average, by 35%
- Maintenance costs reduced by 44%
- Travel time reduced by 40%
- Delays almost disappeared
- The road became passable to all vehicle types throughout the year

Box 2: Indirect Effects
(Source: Olsson, 2009)

- Uncompetitive production system of a fishing oligopoly collapsed
- Fishing sector-related groups increased income considerably (*See Table 1*)
- Work opportunities raised sharply

Box 3: *Indirect Effects*
(Source: Olsson, 2009)

Group/Year	1990	1994	1995	2001	2005
Fish Deliverer	500*	500	700	1,000	N/A
Casual Labourer	2,500	2,500	4,500	4,500	N/A
Employed Fisher	5,500	5,500	8,000	8,000	N/A
Vessel Owner	20,000**	20,000	30,000	30,000	43,000

Table 1: *Average Monthly Gross Incomes, 1990-2005, of fishing-related groups (pesos)*

Note: * Per delivery; ** Maximum
(Source: Olsson, 2009)

3.2.2 The People's Republic of China

Focusing on the agricultural sector, Felloni et al. (2001) showed that the density of roads per hectare of agricultural land in the People's Republic of China has a significant and positive effect on agricultural production and on land and labor productivity. Given that roads and energy are central to technology diffusion and production intensification and for facilitating access to the input and output markets, they argue that the availability of roads and electricity are crucial to the modernization of Chinese agriculture.

Fan et al. (2008) took a more comprehensive approach to the problem by using a system of equations model to account for endogeneities. They quantified the effects of rural infrastructure on growth and poverty reduction in rural the People's Republic of the People's Republic of China between 1970 and 1997. Results suggested that public investments in roads, together with investments in education and agricultural research, helped to reduce rural poverty and regional inequality to different extent in all parts of the People's Republic of China (*See Table 2*). Investments in roads also contributed to growth in agricultural production. Benziger (1993) tested whether greater access to infrastructure and to urban markets increases the intensity of input use and productivity in the rural sector in the province of Hebei. His econometric results show that road density and distance to the nearest city positively affect the use of fertilizer per unit of land, machinery per worker, and land and labor productivity.

Region/Road Level	High Grade Road <i>(number per million RMB)</i>	Low Grade Road <i>(number per million RMB)</i>
Average	49.95	900.53
Northeast	22.76	317.41
North	83.09	1,872.96
Northwest	93.91	737.02
Central	56.14	1,567.39
Southeast	16.08	1,020.06
Southwest	162.08	4,819.21
South	12.45	470.77

Table 2: Returns in Rural Poverty Reduction to Road Investment in the People's Republic of China, 2001.

Note: All estimates are statistically significant at the 10% level.

(Source: Fan et al., 2008)

3.2.3 India

Sengupta et al. (2007) observed the pure partial effect of the India National Highway 2 (NH2) on rural population living in its proximity. Revealed are that the road is extensively used by the rural population for various social-economic activities, and proximity to the highway has significant influence on major aspect of social-economic well-being such as income level and poverty reduction (*See Fig 3 and 4*). Their econometric results indicated that greater opportunities of employment and earning in non-farm activities are generated. Accesses to education and health facilities improve. Household incomes increase and so do asset holdings. A poor rural household living in the vicinity of NH2 has been proved to derive considerable benefits.

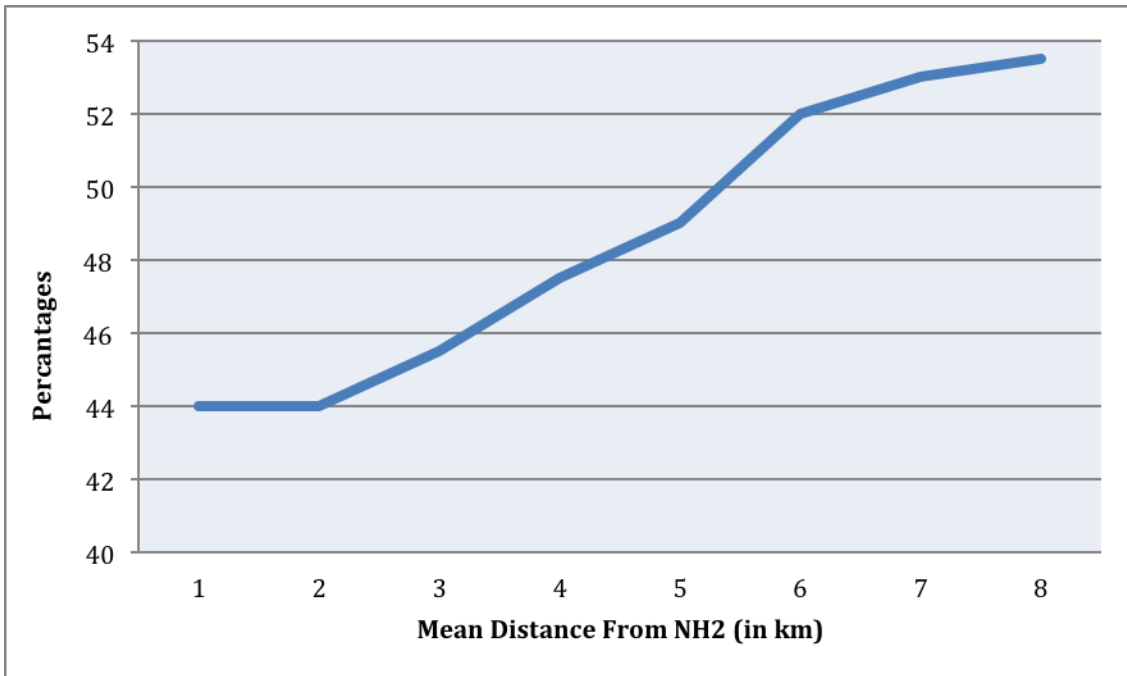


Figure 3: Proportion of Poor Households Based on Poverty Line
(Source: Sengupta et al., 2007)

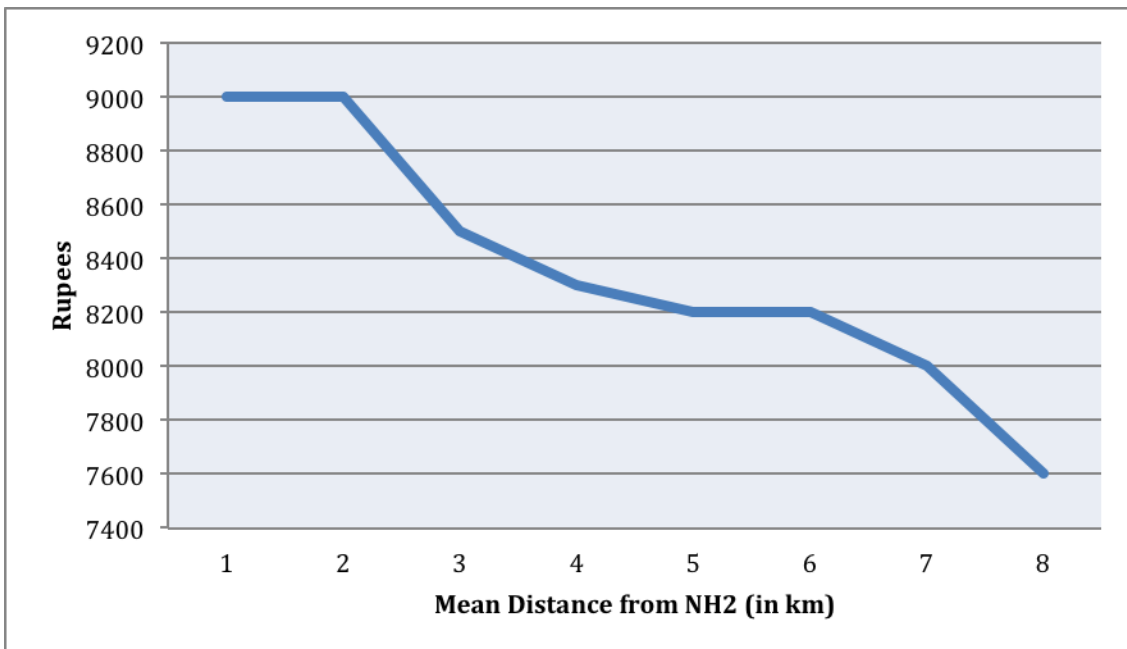


Figure 4: Per Capita Income (annual)
(Source: Sengupta et al., 2007)

4. Urban Poor: A Critical Need for Improved Accessibility

Poverty is a phenomenon of many dimensions. It is not just about insufficient income to meet basic needs, but also about the deprivation of basic social rights and limited access to essential services such as public transport. Urban poverty manifests itself through the spatial segregation of the poorest in the peripheries – areas characterized by insubstantial public services and deficient infrastructure – where the provision of mass transport is inappropriate in terms of price as well as availability. As a result, the poorest have restricted access to the opportunities offered by life in the city. Fig. 6 showcases the Dharavi slum in Mumbai, India.

The transport problems of the urban poor have been highlighted in the literature in the past (Dimitriou, 1993). Nevertheless, neither the connections/ inter-relationships between poverty and urban transport (Hook, 1998) nor the distributional impacts of urban transport projects are well understood. Much remains to be done to translate good intentions into practical initiatives that make a difference to the lives of people living in poverty in the urban area.



Figure 6: Dharavi slum, Mumbai, India

(Source: http://es.wikipedia.org/wiki/Archivo:Dharavi_slum,_Mumbai,_India_-_20081220.jpg)

4.1 Current Status

The current state of transport accessibilities in the context of emerging Asian cities is characterized by the fact that people living in poverty travel, on average, less far and make fewer trips but take more time to do so than higher-income people (Hook, 1998). There are intimate links between the mobility of the poor and their range of housing and employment options. For low-income people in many Asian

cities even public transport fares are not affordable or a very great burden. For example in 1990 in the (then) lower-middle-income city of Jakarta, 14% of households could afford only 20 single bus tickets or less per month, and 40 percent could afford only 53, compared with the average household usage of buses of 101 tickets per household per month (Dreesbach and Wessels, 1992).

4.1.1 Walking Being the Predominant Mode of Urban Poor

In most of these cities, the majority of trips by the urban poor are on foot. For example in Jakarta in 1985, walking accounted for almost 60% of all trips taken by the lower-income half of the population. The Origin and Destination survey for the São Paulo Metropolitan Region reported in 2002 that people with lower incomes make about 60% of their trips each day on foot while the rich make five times more per day on motorised transport. A high percentage of travel in Indian cities is by walking or cycling. With 26% of the population below the poverty line in 1999–2000 (Ministry of Finance, 2002), roughly a fourth of urban residents cannot afford the basic necessities of life, including virtually any form of public transport or even a bicycle. Walking and cycling are most important in smaller cities, accounting for over two-thirds of all trips (see Fig. 7)

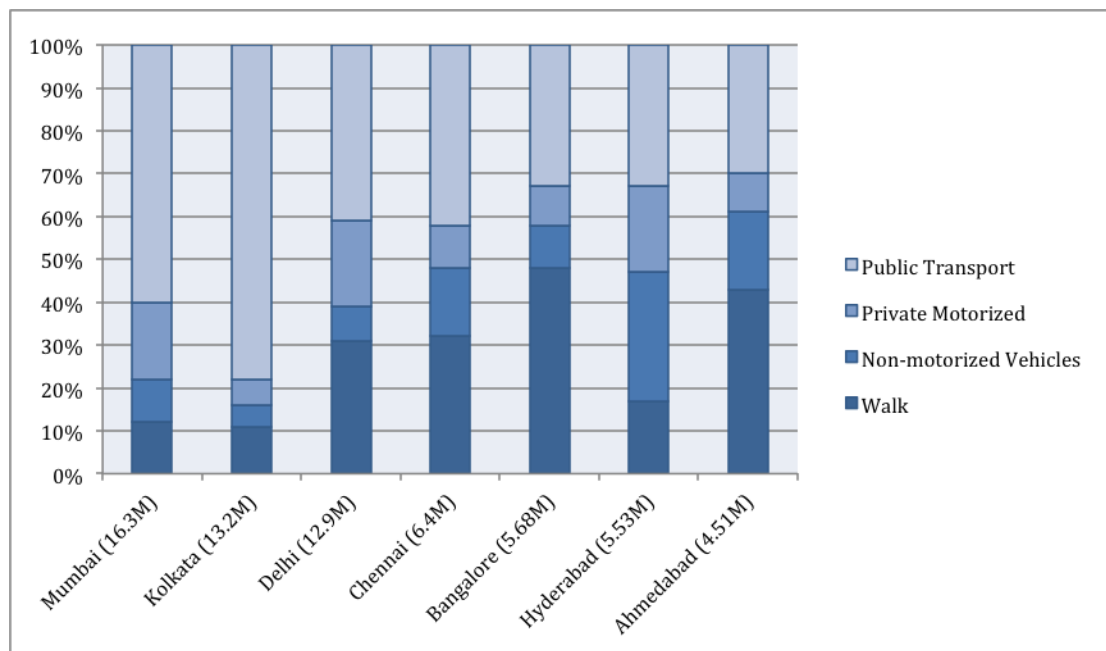


Figure 7: Percent distribution of trips by means of travel for selected Indian cities, 2002. (Sources: Pendakur, 2002; World Bank, 2002.)

4.1.2 Travel Time

Several studies have tested the hypothesis that travel time decreases as income increases, since the poor cannot afford faster transport modes. Roth and Zahavi, examined data on daily travel times for motorized travelers in Bogota, Salvador, Santiago, and Singapore, and found that in three of the four cities, travel time decreased as income increased. Deaton (1987) found that in Jaipur workers who lived in higher-income areas spent less time traveling than those in poorer areas, even though poorer households lived closer to the city center than wealthier households.

The prevalence of long walking trips is a key indicator of poor accessibility by the urban poor to facilities and affordable mobility. This implies serious problems of access to employment opportunities, recreational activities and social facilities, since the distance the poorest are able to reach each day is restricted solely to walking.

4.1.3 Expenditure on Transport

Two measurements are used in the literature to evaluate the impact of transport expenditures on the budget of a traveler or household: (i) transport costs as a percentage of total income; (ii) transport expenditure as a percentage of total expenditure. According to Deaton, because incomes tend to be variable, expenditures provide a more reliable guide to living standards of the urban poor than income. He finds that the two measures paint a very different picture of the burden of transport expenditure on poor urban households: transport shares of income are consistently higher than transport shares of expenditure.

The numbers on transport expenditure as a share of income vary widely, from 3% to 30%, as would be expected when looking across various cities. The data from a TRRL report comparing a middle and high-income residential area with low-income resettlement colony in Delhi, both 20-25 kilometers from the city center, show that poor families spent a higher proportion of their income on travel. Poor households in the lower income area spent 20-25% of their income on transport with an area average of 11%, while in the higher income neighborhoods, households spent 9% on average on transport.

Deaton (1987) found that in India, Tunisia, Sri Lanka, and Thailand, travel expenditure ranged from 2.8% to 5.6% of total expenditure for urban households. Poor households, in general, did not spend over 10% of total expenditures. Many of the poor, however, spent nothing on transport. In Sri Lanka, Tunisia, and Thailand, one-half of the households in the bottom of consumption distribution spent nothing on transport. This implies that household members always walk (or have access to free transport). In most of the surveys, the share of the budget spent on travel rises from poorer to richer families. Total expenditure elasticity for transport is larger than one. A possible explanation for this is that at higher expenditure levels, the

households have more money to spend on leisure and social activities that involve travel.

The accessibility issues faced by urban poor is now a focus of interest by multilateral lenders such as the World Bank in the wake of criticisms and subsequent reviews of the poverty impacts of transport projects (Gannon and Liu, 1997). The crucial role of transport in the quest for sustainable human settlements and improving the lives of those living in poverty has now been acknowledged at a number of international meetings, particularly during Habitat II in Istanbul in 1996 and at the Second International Conference on Urban Poverty in 1997 in Florence.

4.2 Main Issues

4.2.1 Policy Distortion for Meeting the Needs of an Elite Minority

The concentration of wealth among economic and political elite has distorted transport policies in all emerging Asian countries. While the poor suffer the most from severe and worsening transport problems in cities, government policies generally focus on serving the needs of an elite minority. For example, a disproportionate share of government funds is spent facilitating the ownership and use of private cars, while the needs of mostly low-income pedestrians and cyclists are ignored. Similarly, public transport does not get the funding or traffic priority it needs because the elite do not use it. Rapid growth, low incomes, and extreme inequality are among the main underlying causes of transport problems in developing countries.

The poor cannot afford private cars. Nor can the very poor afford the small motorcycles that are now plentiful in many Asian cities. People who are economically, physically, and socially disadvantaged are harmed by transport policies that focus on economic efficiency (narrowly defined) and by automobile-focused transport priorities that do nothing to meet their travel needs.

4.2.2 Disproportionate Share of External Costs

They also tend to suffer a disproportionate share of external costs, since they can afford less protection against traffic impacts. The urban poor live in congested slums in older, deteriorating inner-city areas or in illegal squatter settlements on the outskirts of cities. Those living near the center suffer not only from overcrowded housing but also from high levels of air pollution, noise, congestion, and traffic danger. Increased dependence on private motor vehicles tends to displace non-motorized transport and reduce the variety of public transport available to the poor. There is a threshold effect in motorization which means that a small increase in a city's level of income can lead to a sudden rapid surge in the ownership of private vehicles, as was seen in Malaysian and Thai cities between about 1987 and 1997 (Pendakur, 1997). Fig. 8 dramatize the extremely rapid growth of motorcycle ownership in India, which increased 16-fold between 1981

and 2002. Based on data from WHO Road Safety Status (2013), Table 3 presents the evolution of 2-3 wheeler stocks over worldwide regions during the period between 2002 and 2010, revealing a high ownership rate and dramatic annual increase among Asia Pacific countries (compared to the rest of the world). It is early in the motorisation process that public policy intervention can apparently have the greatest impact and help preserve the viability of those modes that the poor depend upon most (Barter and Kenworthy, 1997).

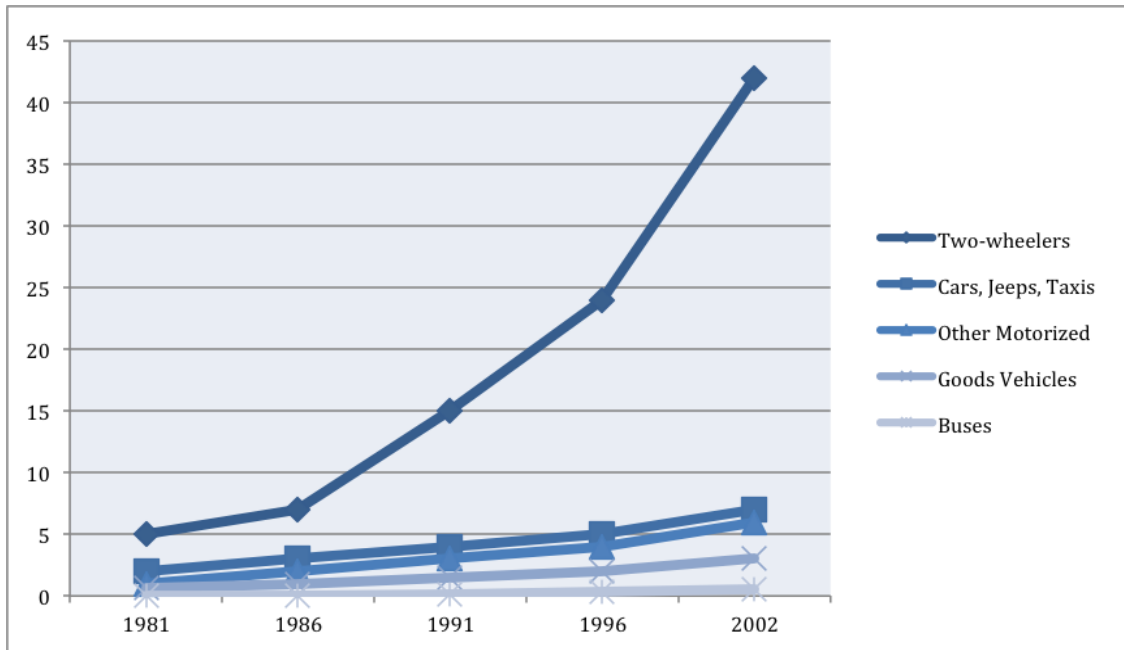


Figure 8: Growth of India's motor vehicle fleet by type of vehicle, 1981–2002 (in millions).
Note: "others" includes tractors, trailers, motorized three-wheelers (passenger vehicles) such as auto rickshaws and other miscellaneous vehicles that are not separately classified (Source: Ministry of Road Transport and Highways, 1999, 2000, 2003).

Region/Rate	Annual Increase (2002-2010)	Ownership Rate
Africa	4.67%	1.0%
Asia Pacific	11.59%	9.2%
Oceania	-0.33%	6.0%
Middle East, Central Asia	5.95%	4.5%
South America, Caribbean	14.57%	5.6%
East Europe, Russian Federation	-1.55%	2.7%
North America	1.82%	2.9%
West Europe	1.50%	6.9%
World Total	9.54%	6.5%

Table 3: the evolution of 2-3 wheeler stocks over worldwide regions
(Source: WHO Road Safety Status, 2013)

4.2.3 Less Priority to Cycling and Walking

The transport needs of the poor have been neglected or a invisible partly because walking itself has also been too often ignored and not even considered to be transport at all. Most transport journeys start with walking or involve walking at some section of the journey. The economic privations of the 1980s in Brazilian cities saw a large increase in the share of walking trips (Poole, Pacheco and de Melo, 1994). In most Asian cities pedestrians suffer extraordinarily hostile and dangerous street obstacles, hazards and official neglect. Bicycles are within reach of many poor households and have been widely used for the last several decades (Replogle, 1992). Unlike most African and Latin American cities, bicycles are affordable even to many of those for whom public transport is not affordable. Nevertheless, the up-front cost, lack of credit facilities, the danger from motor vehicles and fear of theft are significant barriers to bicycle ownership by the very poor in many cities (Gallagher, 1992).

4.2.4 Road Safety

The overall global road traffic fatality rate worldwide is 18 per 100,000 people. However, low and middle-income countries have the highest annual road traffic fatality rates, at 18.3-20.1 per 100,000. Fig. 9 shows traffic death fatalities over main Asia Pacific regions. The worst performing region is Southeast Asia, with countries such as Malaysia and Thailand having 24.2 and 19.9 Traffic death fatalities per 100,000 people, respectively. In low and middle Asian Pacific countries, 33% of the fatalities are made to motorcyclists. The associated cost of the DGP lost from these fatalities is estimated to be around 3%.

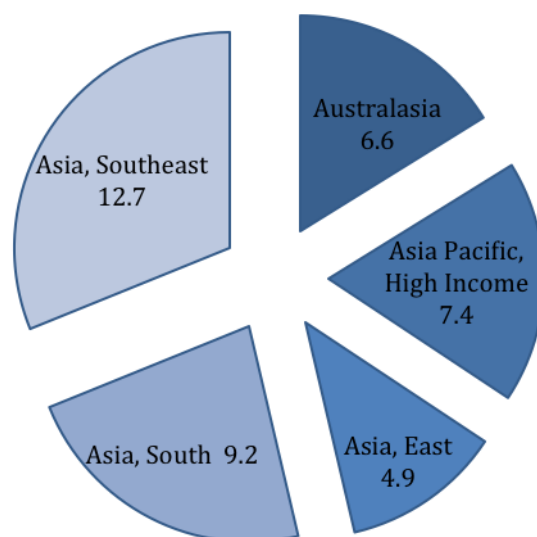


Figure 9: Traffic death fatalities per 100,000 people over main Asia Pacific regions
(Source: WHO Road Safety Report, 2013)

The traffic patterns in the low and middle-income countries are not only different but are also more complex than those in the high-income countries. Traffic in low-income countries comprises a much higher share of vulnerable road users and so vehicles, roads and the environment have to be designed for their safety. Solutions for such problems are not readily available and very innovative work needs to be done around the world to arrive at new policies and designs.

Table 4 shows that in less-motorized Asian countries, the vulnerable road users—pedestrians, cyclists and motorized two/three-wheeler riders—sustain a vast majority of the fatalities and injuries due to road traffic injuries.

Location/Mode	Cyclists	Two/Three Wheelers	Other
Thailand (2010)	3	73.5	2.5
Malaysia (2010)	2.8	58.7	3.4
Lao PDR (2010)	1.3	74.4	3.4
Indonesia (2010)	1.7	35.7	35.4
Cambodia (2010)	5	12	3
Bangladesh (2009)	4	11	2
Pakistan (2010)	0	38.6	4.4
India (2010)	4.6	32.4	38.7

Table 4: Percentage Distribution of Road Traffic Deaths by Type of Road User
(Source: WHO, 2011)

5. Policy Recommendations

5.1 For Promoting Rural Accessibility

Improving accessibility is synonymous with reducing isolation. Strategies aimed at improving rural accessibility—walking time to the nearest road—and the central role of roads and motorised transport in integrating remote regions and communities into the national economy, and the nation into the global economy. Although the primary emphasis is on physical rather than structural measures to enhance accessibility, this strategy responds to a strong consensus among rural communities. Future programs aimed at reducing rural isolation must take a multidimensional approach to social and economic integration and employ a variety of measures and interventions such as:

a) Establish warehousing, buffer stocks, cold storage facilities, and hostelling

These can be effective substitutes for all-weather motorized road access in terms of making markets, schools, and basic health services accessible to rural communities.

b) Use ropeways in the context of certain countries.

Transport cargo over escarpments and steep hills, and across gorges or deep valleys, especially in remote areas of high agricultural/forestry potential where road building is either not technically feasible or is prohibitively expensive. Ropeways for passengers would require expensive safety features, but could be justified in areas of good recreational (e.g., skiing) and tourism potential. Example include one major 7.0km-long ropeway with a bucket capacity of 800 kg capacity in Tashila, Bhutan (See Fig. 5), for timber haulage and limited transport services to villages in the area.

c) Bring essential services to the communities.

Use periodic mobile camps or regular circuits by itinerant teachers, health workers, extension agents, and public administrators such as judges and land revenue officials (even if they have to travel on horseback); this approach may again be more cost effective than providing these services through fixed facilities, dependent on road access.



Figure 5: Ropeway in Tashila, Bhutan
(Source: <http://eng.yuko-travel.ru/gallery/51/51044/>)

This is not to downplay the importance of all-weather road access in reducing rural poverty, expanding markets, and promoting commerce, only that provision of road access is only one measure among a host of technologies and approaches to reduce rural isolation and improve the economic and living conditions of the rural poor. Future programs to improve rural accessibility should be holistic and rely on a broader array of policies and programs beyond provision of rural roads to minimize rural isolation. With respect to rural transport interventions, the objective should be to integrate all viable alternatives from trails and footbridges to air transport into an integrated, least-cost service network that is regionally balanced, and is safe, convenient and economical to use.

5.2 Improving Accessibility to the Urban Poor

The crucial role of transport in the quest for sustainable human settlements and improving the lives of those living in poverty has now been acknowledged, however, much remains to be done to translate good intentions into practical initiatives that make a difference to the lives of people living in poverty in the urban areas.

a) Focus On the Modes Used By the Poor

An important approach in a pro-poor transport strategy is to make improvements that benefit the modes most widely used or potentially used by the poor (Gannon and Liu, 1997). Thus, making walking easier and safer would benefit the poor, since most of their trips are on foot. Similarly, policies that succeed in making non-motorised vehicles and public transport more accessible and affordable to the poor will make a large difference and has enormous potential in many cities.

b) Integrated Approach to Transport Planning

A narrow economic efficiency focus helps the rich more than the poor (and may actually harm people living in poverty). For example, an efficiency-focus leads to a bias towards "strategic" infrastructure, higher-speed, longer-distance links and projects that "save time" for motor vehicle users. This is at the expense of pedestrian, NMV facilities, and public transport and projects that enhance local, low-speed accessibility which have a much greater direct positive impact upon the lives of the poor (Dimitriou, 1993). Greater emphasis on the basic access and mobility and travel patterns of the poor is needed (Gannon and Liu, 1997; Hook, 1998).

c) Participation in Transport Planning

Without broad-based consultation, the main voices that tend to be heard by government on transport issues are the well-organised and wealthy lobbies for car users, the motor vehicle industry, and the infrastructure construction industry etc.. Transport is one field where public policy clearly does have a major impact upon the outcomes even in low-income settings. Participation is essential in order to balance the effects of market and government failures (Hook, 1998).

d) Sustainability and Environmental Issues

Global environmental concerns make overall sustainability including policy priorities (away from private vehicles) in Asian urban transport. However, local environmental and traffic impacts are a compelling issue and reason for change, and one with an important environmental justice component. Dense Asian cities tend to face severe problems with local air pollution and other local impacts of traffic. These local impacts effect the urban poor particularly severely, since they are the least able to avoid or seek protection from them (Hook, 1998).

e) Promoting Road Safety

Vast majority of the Asia Pacific countries have not established comprehensive legislation or effective law enforcement on 5 key risk factors for road traffic injury. In response to the issue, WHO (2013) proposed a set of multi-dimensional policies to promote road safety in the Asia Pacific region. The main recommendations are presented in Box 4 below:

- Establish multi-sectoral “Lead Agency” for road safety at highest level with political, technical & financial govt. support for multi-sectoral activities as Lead Agency is vital for national road safety strategy
- Policy support for strict enforcement of road safety laws, and coupled them with public awareness
- Promotion of Public and Non-Motorized Transportation System and separation of vulnerable road users as a way of protecting them
- Safe infrastructure; no pot holes on roads & protect pedestrians, motorcyclist and bicyclist footpath, special road lanes
- Earmarking funds for road management and road safety activities
- Integrate road safety into primary health care packages and public health systems
- Better Interagency Coordination at Regional and Country Level

Box 4: Policy recommendations for Asia Pacific Countries to Promote Road Safety
(Source: WHO, 2013)

f) Low Cost Strategies

A pro-poor approach to urban transport should be a low-cost approach. A low-cost, pro-poor approach is also not necessarily a second-class transport approach. The successful low-cost strategy of Curitiba in Brazil with its "surface metro"(BRT) using busways is well-known (Cervero, 1995). Although it is not easy to formulate politically acceptable restraint policies, but finding such measures needs to be a high priority for low/middle-income countries everywhere. Restraint of private vehicles offers a way for such cities to buy the time needed for a gradual improvement to public transport, and it also reduces the urgency to expand the road system.

6. Conclusions

The paper firstly present the current status of the accessibility in the context of emerging Asian communities; secondly, discuss issues and challenges of improving or providing transport/access; thirdly, provide some empirical evidence and good examples of social-economic benefits of improving or providing transport/access; and lastly, propose some policy recommendations for promoting the development of accessibility in a sustainable fashion.

The primary accessibility issues for the rural population reorganized here include severe scarce of physical access and insufficient and inadequate road maintenance. Instead of focusing solely on the construction of road accesses, policy recommendations take a multidimensional approach to social and economic integration, and employ a variety of measures and interventions such as providing

access to communication and information technologies and bring the essential services to the communities.

Accessibility challenges faced by the urban poor in the emerging Asian cities, on the other hand, are characterized by more attention being paid to the needs of an elite minority, policy makers' focus on narrowly-defined economic efficiency, disproportionate share of externality costs, the fact that walking as a mode of travel being largely ignored and under promotion of road safety. Proposed policy initiatives include: focusing on the modes used by the poor, solving the dilemma of the narrowly defined economic efficiency, promoting road safety and a set of low cost strategies which is expected to be compatible with economic efficiency, an emphasis on ecological sustainability and with the creation of highly livable and attractive cities.

References

- Barter, P. A. (1998). "An International Comparative Perspective on Urban Transport and Urban Form in Pacific Asia: Responses to the Challenge of Motorisation in Dense Cities". *Ph.D. Thesis*. Murdoch University, Western Australia.
- Benziger, V. (1993). "China's rural road system during the reform period". *China Economic Review*, Vol.4, No.1, pp.1-17
- Cervero, R. (1995). *Creating a Linear City with a Surface Metro: The Story of Curitiba, Brazil (Working Paper 643)*. National Transit Access Center (NTrac), University of California at Berkeley.
- Deaton, A (1987). *The Demand for Personal Travel in Developing Countries*, Infrastructure and Urban Development Department, Report INU 1.
- Dimitriou, H. T. (1992). *Urban Transport Planning: A Developmental Approach*. Routledge, London
- Engwicht, D. (1993). *Reclaiming Our Cities and Towns: Better Living with Less Traffic*, New Society Publishers
- Fan, S. Chan-Kang, C. (2008). "Regional road development, rural and urban poverty: Evidence from China". *Transport Policy*, Vol. 15, No. 5, pp. 305-314
- Felloni, F., Wahl, T., Wandschneider, P., Gilbert, J. (2001). *Infrastructure and Agricultural Production: Cross-Country Evidence and Implications for China*. Washington State University, Pullman
- Gallagher, R. (1992). *The Rickshaws of Bangladesh*. University Press Limited, Dhaka
- Gallagher, R. A. (1998). *Report on the Main Lessons from the Pilot Project on Integration of Non-Motorised Transport in the Urban Transport System of Dhaka, Bangladesh*. United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP).
- Gannon C. A., Liu, Z. (1997). *Transport and Poverty*. The World Bank Research Paper. Available at:
<http://www.rhd.gov.bd/Documents/ExternalPublications/WorldBank/TransSectPub/contents/documents/B03.pdf>
- Garrison, W.L., Souleyrette, R.R., (1996). "Transportation, innovation, and the companion innovation hypothesis". *Logistics and Transportation Review* Vol. 32, No. 1, pp. 1-20

Halden, D. (2002), "Using Accessibility Measures to Integrate Land Use and Transport Policy In Edinburgh and Lothians," *Transport Policy*, Vol. 9, No. 4, pp. 313-324

Hansen, W. G. (1959). "How Accessibility Shapes Land Use," *Journal of the American Institute of Planners*, Vol. 35, No. 2, pp. 73-76

Hook, W. (1998). *Transport and Sustainable Human Settlements: A UNDP Policy Overview (DRAFT)*. Institute for Transportation and Development Policy (ITDP).

International Labor Organization (2007). *Sustaining the Benefits of Improved Accessibility*. Available at:
<http://www.ilo.org/public/english/employment/recon/eiip/download/setp/setp19.pdf>

Kranton, R. E. (1991). *Transport and Mobility Needs of the Urban Poor*. World Bank Discussion Paper, Available at:
http://www.wds.worldbank.org/servlet/WDSContentServer/IW3P/IB/1999/12/20/000178830_98101902160241/Rendered/PDF/multi_page.pdf

Lakshmanan, T.R. and Chatterjee, L.R. (2005). "Economic consequences of transport Improvements". *Access*, Vol. 26, pp. 28-33.

Litman, T. (1996). *Evaluating Transportation Equity*. Victoria Transport Policy Institute, Canada

Moseley M. (1979). *Accessibility: the rural challenge*. Methuen, London
Motorized Transport in Asia. University of British Columbia, Vancouver, Canada.

Nogales, A. (2004). *Lao PDR Transport Sector Brief*. World Bank East Asia and Pacific Region Transport Sector Unit. Available at:
<http://www.worldbank.org/transport/transportresults/regions/eap/eap-lao-output.pdf>

Olsson, J. (2009). "Improved road accessibility and indirect development effects: evidence from rural Philippines". *Journal of Transport Geography*, Vol.17, No. 6, pp.476-483

Patel, S. and Sharma, K. (1997). *Mumbai Transport Case Study*. In International Forum on Urban Poverty, Florence, 9 - 13 November 1997: United Nations Centre for Human Settlements (Habitat).

Pendakur, V.S. (2002). *A Policy Perspective for Sustainable Cities: Non- Motorized Transport in Asia*. University of British Columbia, Vancouver, Canada.

Peters, D. (2003). Old myths and new realities of transport infrastructure assessment: implications for EU interventions in Central Europe. In: Pearman,A., Mackie, P., Nellthorp, J. (eds.), *Transport Projects Programmes and Policies.Evaluation Needs and Capabilities*. Ashgate, Aldershot, pp. 43–72.

Poole, A. D., Pacheco, R. S. and de Melo, M. A. B. C. (1994). *Moving People: Transport Policy in the Cities of Brazil*. International Development Research Centre, Ottawa

Replogle, M. (1992). *Non-Motorised Vehicles in Asian Cities (Technical Paper 162)*. World Bank.

Sengupta, R., Coondoo,D., Rout, B. (2007). “Impact of a Highway on the Socio-Economic Well-Being of Rural Households Living in Proximity”, *Contemporary Issues and Ideas in Social Sciences*, Vol 3. No. 3

Townsend, C. (1995) *People, Culture and Behaviour in Bangkok Urban Region: Liabilities or Assets for Transportation Planning? Master of Environmental Design (Planning)*. University of Calgary, Alberta.

Vikerman, R.W (1998). Transport, Communications and European Integration. In Prinder. D. (eds), *The New Europe: Society and Environment*. Wiley, London PP.223-238.

World Bank (2004). *Bhutan - Transport Sector Note*. Available at: <http://documents.worldbank.org/curated/en/2004/08/5172911/bhutan-transport-sector-note>