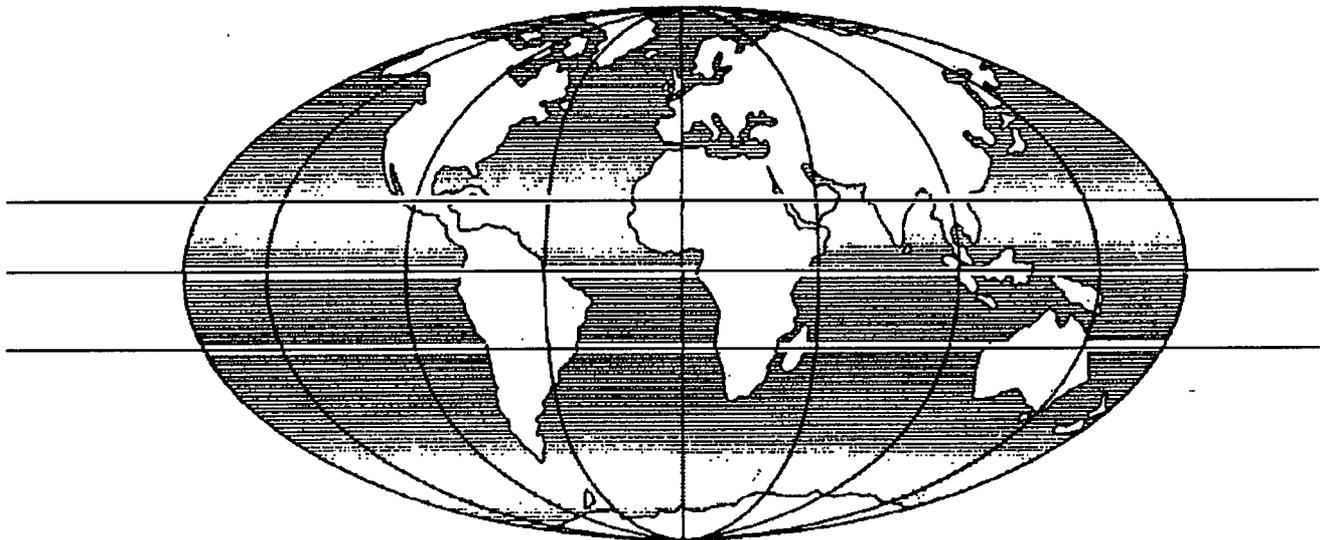




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**TITLE The commercial use of non-motorised
transport: evidence from Accra, Ghana**

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AMPONSAH, F, J TURNER, M GRIECO AND P GUITINK (1996). The commercial use of non-motorised transport: evidence from Accra, Ghana. *Paper no 96, Transportation Research Board, 75th Annual Meeting, January 7 - 11, 1996, Washington, D.C.*

PA 3165/96

Abstract

Accra's traders continue to make use of the hand pushed or hand pulled cart for moving their stock across the city. These non motorised forms of transport play a key role in a low income economy: developing economies with their large informal sectors contain a preponderance of enterprises with a restricted capital base which require and make use of low cost transport forms. The bicycle though well suited to the small load requirements of much petty trading is not regarded as a suitable mode of transport for women who make up the majority of Ghana's traders. A World Bank project designed to support and promote non-motorized modes of transport is currently being implemented. The paper discuss the practices and prospects of the commercial use of non motorised transport in Ghana. describes the World Bank project which supports and promotes these transport forms and discussess the appropriateness of non motorised transport modes for developing economies with their large informal sectors and plentiful supply of petty trading enterprises.

1. Putting the cart before the car: the commercial use of non-motorised transport.

Accra's traders continue to make use of the hand pushed or hand pulled cart for moving their stock across the city. These non motorised forms of transport play a key role in a low income economy: developing economies with their large informal sectors contain a preponderance of enterprises with a restricted capital base which require and make use of low cost transport forms (Grieco et al., 1996). The large number of very small outlets works against the majority of traders having access to an operating retail distribution system. Consequently, traders have to transport their stock between central markets and their place of sale - stall, kiosk or trading table. Traders transporting small volumes of stock, and the majority of traders in a petty trading economy are doing precisely this, have a need for small load as well as low cost forms of transport. In Accra, the two wheeled or four wheeled truck or trolley provides exactly this facility. In addition, in Accra the congestion of market areas, the distance between trading areas and transport termini create a context where wheeled portering flourishes. The low costs of labour as compared with the comparatively high costs of motorised transport technologies have generated a set of conditions where hand pushed or hand pulled trolleys or trucks are a routine mode of transport for goods. These manual vehicles mingle with motorised traffic creating considerable delay and experiencing high accident levels in this interaction with motorised traffic. On the existing evidence, it seems unlikely that the importance of wheeled portering in this transport structure will diminish in the near future. Given the consequences of non-motorised transport arrangements for the operation of motorised transport and vice versa, the operation of wheeled portering in Accra requires some investigation. This paper provides a first approach to understanding the role of wheeled portering in the transport organisation of an urban area in a developing African country.

The next section reports on two studies of non-motorised transport in Accra, Ghana: the first a study of the porters who push and pull the two or four wheeled carts and who are locally termed 'truck boys', the second a study of traders who make use of these trucks or trolleys. Section 3 discusses the opportunity which a petty trading economy presents for developing the commercial use of the bicycle. It notes that in Ghana, the majority of traders are women and that there are cultural barriers to women cycling. It argues that policy attention should focus upon altering these cultural barriers so as to ensure the commercial take up of cycle use as part of petty trading transport organisation and thus promote sustainable transport policy. Section 4 describes a World Bank project which has been designed to support and promote the use of non-motorised transport forms, based on a short term strategy aimed at technical improvements and a longer term strategy aimed at tackling cultural constraints. Section 5 concludes the paper by discussing the importance of non-motorised transport as an appropriate form in societies which have large informal sectors. Developing economies with their preponderance of petty trading enterprises require the support and development of low cost transport forms.

2. **Trolleys, trucks and traffic congestion: cost and time in traders' non motorised transport choices.**

Large, bulky loads which are conveyed by motorised transport in Western countries are transported by hand pushed, wheeled transport in Ghana: truck boys are offering a low cost, manual option to the higher cost, motorised modes of tro-tro (the minivan fleet which composes the informal public transport system) and taxi. In order to gain insight into the workings of the truck and trolley based non-motorised transport sector, interviews were conducted with seventy two male porters (Apt et al., 1994). In addition, fifty interviews with traders using non motorised transport were conducted. Truck boy and trader accounts of the non-motorised sector are compatible and confirm one and other: a key finding is that trucks and trolleys are operating in a hostile environment. Both motorised transport and traffic authorities behave in such a way as to endanger and inconvenience non-motorised transport.

The study of 50 traders (Amponsah et al., 1994) using non-motorised transport i.e. hand pulled trucks and trolleys, found that the majority of users of non motorised transport are also users of motorised transport. The choice of mode depends upon weather conditions, traffic conditions, accessibility conditions, load size and cost/ income constraints. During rainy weather, traders shift mode from non motorised to motorised transport in order to avoid spoilage of goods, particularly food stuffs. Similarly, seasonal considerations produce a change in mode, at Christmas and on rainy days, traders switch from non-motorised to motorised modes: the increase in the demand for goods in festival seasons results in traders transporting larger loads than under normal business conditions. Larger loads mean a change in mode.

Trader in plastic goods, New Town:

I use motorised transport when I am taking larger quantity of plastic goods especially getting to the Christmas and the New Year or Easter. Aside the occasion days when I usually use motorised transport the only way by which I transport my goods is through the use of truck.

Trader in beans, rice, groundnuts, New Town:

I use motorised transport when the goods are plenty and not belonging to me only. Also when the weather is bad i.e. cloudy, I use motorised transport. On the other hand I use non motorised transport (kayayoo or truck) when all the goods belong to me and the weather is good i.e. when there is no fear of rains.

There were a number factors used to explain their patterns of mode shifting between motorised and non-motorised transport forms by traders. The bulkiness of goods frequently determined which mode was to be used, however, where the bulkiness of goods led some traders to select motorised transport it led others to select non-motorised transport. Distance also entered the equation. Where goods could be obtained locally then non-motorised

transport was frequently used but where greater distances had to be covered, the trader experienced pressure to use the more expensive mode.

Traders in travelling bags, provisions and soaps, Adabraka:

The charge for using non motorised transport is comparatively cheaper and the distance from Central Accra where they buy most of their goods to their store is short such that it takes no time for truck boys or kayayyos to cover with a few minutes.

Trader in pillows, roofing sheets, nails and shovels, Adabraka:

According to the trader she uses motorised transport for some of the goods like the shovels, nails and other building materials because of the distance. But for roofing sheets and pillows she almost always uses truck.

Not surprisingly, given the use of both modes by the bulk of traders, there is widespread knowledge of the substantial cost differentials which exist between the motorised and non-motorised modes of good conveyance. There was extensive comment by traders on the need to economise on cost in the context of low profit margins pertaining in petty trading.

Trader in soaps and provisions, Adabraka:

According to the respondent the difference in costs between these two transport arrangements is great. Load that costs 1,000 cedis for using non motorised transport will cost over 3,000 cedis when motorised transport is used.

Trader in yam, maize and millet, Jamestown:

Benefits derived from using non-motorised is that the cost of transporting goods is comparatively cheaper and this helps to get the required profit....The difference in costs between motorised and non motorised transport is very large. Truck charges 150 cedis per large bag of maize but motorised transport will never charge anything less than 300 cedis to 400 cedis per bag of maize.

There is some evidence that traders with small profit margins are likely to use non-motorised transport on larger loads, in the recognition that larger loads mean larger transport costs and thus the switch to non motorised transport generates a larger saving. The availability of non-motorised transport operations plays an important role in a low income, petty trading economy. It provides traders with enhanced flexibility in determining the transport costs they will incur in conducting their business. When traders are at a low point in their business income cycle, they make use of the cheaper, non-motorised mode.

Trader in vegetables, cooking oil, Osu:

Truck is used for large quantities of goods and cars (not hired) for smaller quantities of goods. According to the respondent trolleys (two wheeled carts usually pushed by one person) are used for smaller quantities of goods.

Where coordination on motorised transport exists then costs of that mode are lowered. however, where traders have to organise sole transport then the low cost of the non motorised mode is more attractive.

Trader in yam, plantain, cocoyam, cassava, Osu:

I use motorised transport (trotro) when we are about 3 or 4 traders sending goods to one place (Osu) so that we share the total cost involved. Other than that I always use truck or kayayoo when transporting goods to Osu.....According to the trader the difference in cost between these two transport arrangements is not all that great when 3 or 4 traders hire one trotro (low cost car) and share the cost involved. But the difference is great when the cost of hiring the car is paid by one trader.

Trader in smoked fish, tomatoes, pepper, Osu:

According to the trader about 4 of them traders have arranged with a particular trotro driver for their goods on every Monday and Thursday.....She therefore uses truck to beat down the cost of transportation when the need arises for her to go for more goods on any other day aside Monday and Thursday.

Accessibility considerations also played a major part in determining the choice of non-motorised transport. Many traders operate from kiosks, booths and premises which are located down the lanes and alleys of low income neighbourhoods. Trucks and trolleys are able to move down alleys and into compounds which are not accessible by motorised vehicles. The urban design of low income Accra is contributing to the persistence of non-motorised transport: accessing the back lanes and alleys where petty trading occurs through a motorised retail distribution system is problematic. The more flexible trolley or truck can more readily penetrate the local neighbourhoods.

Trader in pillows, roofing sheets, nails and shovels, Adabraka:

The advantage of using truck is that the truck is able to enter the store from which I buy the roofing sheet or the slates and also it can enter my store without difficulty.

Trader in provisions and cooking utensils, Jamestown:

The truck boys carry the goods from the market interior to the packing place and also to the exact trading point where the truck can't go.

Whilst many traders indicated that they routinely traded off longer journey times against reduced transport costs, it was also the case that where greater distances were concerned they were less likely to trade time off against cost. Although, it is not possible to provide exact information on the parameters of acceptable delay from the evidence we have collected, journey times of more than an hour by truck appear increasingly less attractive to traders.

Trader in provisions, New Town:

I use motorised transport when the distance from my kiosk to the place for the goods is far. For example I use car whenever I go for goods from Glamour areas (Accra). But I use truck when I buy from places nearer than Glamour like Circle areas.

In considering the time aspect of mode choice, traders indicated that motorised transport is not always the fastest mode. Motorised congestion generates an advantage for non-motorised transport over short distances. It reduces both the time advantage of motorised transport and reduces accessibility to trading outlets.

Trader in tinned tomatoes and cooking oil, Tudu:

The main advantage gained from using the truck is that the goods come straight to the trading point (kiosk) without any problem. Motorists face the problem of parking places for loading and offloading the goods. They are also not able to get to the exact trading point which therefore requires additional cost of doing that.

Trader in canned fish, canned tomatoes and rice, Tudu:

I use the truck only when there is congestion making it impossible for the car to park near the store.....

An important consideration when deciding upon mode was the escort time requirements of the respective modes. Some traders experienced a need to escort the goods carried by truck boys in order to avoid theft or spoilage, where such a need was perceived then the slowness of the mode had negative consequences for the trader's own time budget.

Trader in margarine and cooking oils, Tudu:

However, some of the load gets lost if you don't follow them leading to waste of time and energy.

The use of lower cost transport exposes traders to a set of dangers, for the use of non-motorised transport in Accra is associated with an increased risk of spoilage, delay, accident, confiscation, and theft. Taking the first of these, weather conditions figured prominently in traders' financial assessments of the respective modes. Using non motorised transport in bad

weather could lead to substantial financial losses: variations in weather, it seems, are likely to have a greater impact on transport organisation in a developing context than they do in more industrialised and motorised society.

Trader in gari, rice, sugar, etc., Adabraka:

I use an Urvan or taxi if I am transporting sugar especially. This is because of experience I've had with transporting sugar or gari by truck. It rained and I incurred a very great loss. I use a truck when I know the weather is clear and there are no signs of rains.....I've not had any bad experience in transporting loads since I started this business. Only once that the goods were beaten by rain resulting in some losses.

Turning to the topic of delay, much of the literature on the informal sector in developing countries assumes that this sector is free from the trappings of bureaucracy and officialdom. In fact, the accounts of traders in Accra indicate that the informal sector is subject to a very high level of semi-official regulation. Such regulation results in substantial institutional delay, delay which has a negative impact on transport costs. The prospect of delay on account of officials 'investigating' the legality of the truck boys and the goods being transported pushes traders towards the higher status transport options such as taxis which are less subject to this interference. In order to short cut the delays, traders and truck boys frequently have to furnish 'dash': they make an unofficial payment in order to be permitted to go about their business.

Trader in cassava, yam, plantain, cocoyam, Osu:

There are no difficulties with the police but the truck boys are most of the time asked to show their Identity Cards. If none of them is able to show one the truck in addition to the loads are confiscated by the City Council Officials which causes delay before goods are returned.

Trader in maize, rice and groundnuts, Osu:

There are no difficulties with the police in transporting loads by truck but we face a lot of difficulties with the AMA officials especially the city council on confiscation of truck, when transporting loads by truck. This leads to unnecessary waste of time and delay before reclaiming or retrieving the truck and the goods.

Whilst it may have been thought that the slower mode of transport would have found more convenient conditions of operation outside of rush hours, in fact, the behaviour of the municipal authorities operated against such an efficient use of road space as truck boys operating outside of normal trading hours were apprehended by authorities on suspicion of theft. Transporting goods on an empty road made truck boys a readier target for semi-official attention.

What emerges clearly from our respondents' accounts of low cost transport options in Accra is that there is a very high level of accidents between motorised and non motorised transport forms. Indeed, the level is so high that it forms an explicit part of traders calculations about which mode they will use. Currently, there is substantial under-recording of the real rate of accidents and very little understanding of the consequences of such an accident rate for the organisation of trade. Of the 60% of our trader respondents who had personal experience of an accident when using non-motorised transport, many of these had experienced more than one accident. The majority of accounts stressed the normality of this experience. At present, it is an experience which has no official register to record it.

Trader in pillows, roofing sheets, nails and shovels, Adabraka:

There have been about 3 or 4 truck accidents but there were no casualties and no spoilage of goods. This is because they are always having roofing sheets as load whenever the truck gets accident.

Trader in children's wear, Adabraka:

Yes I've had 2 bad experiences of transporting load. One was more or less a miracle to me. I loaded a trolley with children's wear but when I reached my store two boxes of such goods were to my surprise containing rags and waste papers. Another incident was an accident of the truck.

Indeed, it seems that accidents are such frequent events that our respondents can identify for us the protocols which hold for the resolving of payment of costs of accidents. The routine occurrence of accidents involving trucks and trolleys gives rise to clear expectations of where the costs are to borne, however, these arrangements take place in a context where there is considerable hostility towards low status, non-motorised transport forms on the part of motorists and of officialdom. When an accident occurs, to get a satisfactory outcome traders and truck boys have to resolve the matter of attribution of costs there and then: involving officials will simply worsen their lot. The people on the street frequently become part of the negotiating process between the colliding parties. Collision protocols are public property and enforced by the public.

Trader in rice, sugar, provisions, Adabraka:

However the spoilage of goods through accident is the owner's expenses....Accident of the truck and loss of some of the goods are the only bad experience I have had since I started this business. According to the trader loss of goods are paid by the truck boys but spoilage of goods resulting from accident is his own expenses.

Trader in wheat, rice, oats, Adabraka:

I have had one bad experience in transporting goods to my store. This was an accident of the truck with a taxi leading to the spoilage of goods and injuring

one of the truck boys. The cost of damaged goods and that of the injured boy were all paid by the taxi driver since he accepted it to be his fault.

Traders typically focus on the attitudes of other road users in explaining the occurrence of accidents. It should be remembered that the traders' account is more likely to be authentic than even that of the truck boys themselves. These traders' accounts are of a transport culture which punishes the non motorist.

Trader in pillows, roofing sheets, nails and shovels, Adabraka:

Motorists are the only main problem we have when transporting goods with truck. All the 3 accidents were caused by motorists. Using truck for roofing sheets is not easy but motorists don't consider the truck boys in any way.

Trader in vegetables, cooking oil, Osu:

Motorists give a lot of problems to the truck boys. They don't regard them as equally important road users. The drivers have no patience for the truck boys though they see them exerting much energy in pushing or pulling the truck.

Male porters and traders alike viewed the interaction between wheeled non-motorised transport and motorised traffic as hazardous. Nevertheless, and despite the ready availability of motorised transport within urban Accra, there is a significant and continuing demand for non-motorised transport services. Given the presence of such continuing demand, explicit attention must be paid to the needs of non motorised transport in the planning of the transport infrastructure for urban Accra.

3. Promoting cycle use amongst Ghana's female petty traders: a natural market for *cycle* use, a cultural barrier to women cycling.

This section considers the fit between the small load characteristics of a petty trading economy and the development of a sustainable transport policy based upon the bicycle. It explores the ways in which existing cultural and infrastructural barriers work against the utilisation of the bicycle by female petty traders. Currently, cycle paths are being developed for Accra with little explicit consideration of the cultural barriers which operate to prevent women cycling. If female petty traders are to avail themselves of these new transport and travel opportunities, cultural changes must accompany this infrastructural investment. Strong cultural rules against women's entitlement to ride have to be combatted in order to permit the neat fit between petty trading and a sustainable transport policy to become effective.

Economic liberalisation programmes have been implemented in countries across the developing world to encourage the efficient operation of markets and the reform of public

sector enterprises. The resulting changes in the ownership of urban public transport often results in an increase in fares. This has a direct effect upon the urban poor who have to absorb such increases into their meagre household budgets if they are to continue to carry out essential activities, 1994). In Asia, cycling is more commonplace amongst the urban poor. The widespread use of this mode allows sudden changes in transport costs to be better absorbed. In an effort to improve the ability of the African urban poor to travel and to improve the urban transport system, the World Bank through its Sub Saharan Africa Transport Policy (SSATP) programme has initiated research into urban non-motorised transport. This research, focusing on East Africa and Francophone West Africa, has looked at ways of increasing the use of bicycles by Africa's urban poor. However, the role that cycling can play within a petty trading economy has been neglected. Bicycles could be used extensively for trading purposes given the small load characteristics of much petty trading.

Within the commercial culture of Ghana, women dominate the trading sector (Garlick, 1971; Twumasi, 1976). Within the transport culture of Ghana, women are greatly under represented in the operation of even the simplest transport technology. They are not active as commercial drivers nor do they operate hand-pulled trucks and trolleys, despite evidence of female ownership in both of these sectors. The same holds true for as simple a transport technology as the bicycle. Yet the bicycle is a form of transport which could have great economic use for female traders given the extensiveness of small volume trading (Pankaj and Coulthart, 1993). Indeed, the bicycle is widely used for petty trading by the male vendors of East Africa.

Cultural stereotypes and infrastructural dangers e.g. the hostile transport culture in respect of non-motorised modes, work against the use of the bicycle by women. The capital requirements of bicycle purchase are beyond the horizons which domestic financial organisation places around female traders. Redesign of bicycles and cycling facilities could assist female traders in accessing more flexible travel modes and time arrangements than they currently enjoy. However, research in Accra indicates that strategies for enhancing bicycle use amongst female traders may differ between the different ethnic sub-communities of the city (Grieco, Turner and Kwakye, 1995). The communities of Nima and Jamestown have different cultural attitudes towards bicycle use: in Nima, the bicycle is seen as an acceptable mode of transport, a symbol of high status. In Jamestown, the bicycle is seen as an anachronism, a low status mode of transport, very dangerous in a motorised world and with little future. In Nima, the key strategic goal must be dismantling the cultural and economic barriers which operate against women cycling: the utility of cycling is already accepted. In Jamestown, the key strategic goal must be to establish that the bicycle has utility as a modern transport mode: promoting women's cycling inside Jamestown must be part of an overall strategy of demonstrating the efficiency and economic benefits of cycling as a modern transport form.

In-depth qualitative interviews with bicycle riders, bicycle owners, bicycle hirers, bicycle sellers and non-riders in Nima, a community which is a major reception area for

Northern migrants, and Jamestown, a community which is composed primarily of indigenous coastal people, in Accra, Ghana indicated a difference in cycling level within the two communities (Turner, 1994). Over fifty two group and individual interviews were conducted on cycle use and cycle access in these areas. Interviewees reported not only on their own characteristics and experiences but also upon those of their households: in all the ownership/non-ownership experiences of 260 people were reported upon. This cycling study found that ownership of a bicycle, even a second-hand bicycle, represents a large capital item for a low-income household. The priority given to cycle purchase and use differs according to the cultural attitude towards cycling: Northerners value bicycles, southerners, on the whole, do not.

Although, cycling is seen as an acceptable activity for boys and men amongst Northerners, it is not seen as a fitting activity for women and girls who have reached puberty. Cultural barriers against women cycling are reinforced by religious barriers towards females riding in Nima. According to one respondent, on one occasion when the Imam saw a female riding a bicycle, he preached against the practice in the mosque. Furthermore, in Nima, neighbours make rather uncomplimentary remarks about females who ride. In Jamestown, cycling is generally frowned upon and both boy children and girl children are discouraged from cycling by their parents and the community as a whole.

Like most of the developing world, Accra has a very mixed road use (Gardner et al., 1989). Within this pattern of mixed road use, there is a negative attitude in the urban area as a whole towards cyclists, and our research revealed particularly towards female cyclists. This leads to a dangerous environment for anyone cycling: they put themselves at considerable risk of death or injury. Female traders who wished to make use of the bicycle in the conducting of their business would have to justify their case in an environment where negative attitudes to the bicycle prevail, where negative attitudes to women's use of the bicycle prevail and where the purchase of a bicycle represents a large capital sum. In a low income household, the female trader bargaining for her 'right' to a bicycle has the odds greatly stacked against her; and most low income households do indeed contain a female trader.

Improving the safety of cycling is a fundamental step in increasing the demand for cycle use amongst the urban population. As recognised by the World Bank (Pankaj and Coulthart, 1993), the segregation of non-motorised modes from motorised modes is fundamental. The provision of dedicated bicycle infrastructure is seen as a way to reduce the risk for cyclists. Women cyclists talked of the abuse they experienced from motorists. They told of being deliberately pushed off the road by vehicles into the gutter, of being shouted and hooted at, of being jeered at and ridiculed for daring to cycle on the public road. This exposure of women to public dishonour is a factor which works strongly against an increase in the number of women cycling: as we saw in the last section, the fear of negative encounters with motorists - the 'fear' of traffic - is sufficient to prevent women from easing their own burden by moving loads off their heads onto wheels. To prevent this negative interaction with traffic which so dishonours women, segregated facilities for cycles and trucks are necessary:

without segregated facilities, cultural factors will continue to militate against the use of non-motorised wheeled transport by the female petty trader.

There are clearly cultural aspects involved in rendering cycling safe. In China and much of South East Asia, there is mass cycling behaviour and safe roadspace for cyclists is determined by sheer weight of numbers (Ghuo, 1994). In the UK the pressure group 'Critical Mass' organises mass cycling events to 'claim back the road'. In the Netherlands and Germany, cycling is a respected means of behaviour and is provided for within the transport system (Tolley, 1990). Positive measures for the provision of bicycle infrastructure and its efficient enforcement may effect some change in the Accra transport culture towards cyclists. As people perceive that, as a result of these official actions, there is no longer an official endorsement for their own negative attitudes, cycling may become more acceptable and thus safer. Increased safety will in its turn lead to increased acceptability, and the virtuous spiral can begin.

Given existing community values and the mixed road use characteristics within Accra, simply providing infrastructure for cycling does not guarantee that it will be used for this purpose. Respondents painted a picture of conflictual interaction of pedestrians with cyclists, motor vehicles, pedestrian street-sellers, kerbside vendors and people living on the street. Cultural attitudes currently favour vendors' rights against cyclists' rights where there is a collision over use of road space. There is significant potential for invasion of dedicated cycle infrastructure by vendors and other non-motorised road users. Motor vehicles have the natural advantage of being able to enforce their share of road-space; solitary bicycles do not!

If there is, as yet, not enough cycle demand in Accra for the bicycle to be able to maintain a right-of-way in competition with other human activity by sheer weight of numbers, how are the cycle lanes which are currently planned for Accra going to be protected from becoming yet more space for street-sellers and pedestrians? (Pankaj and Coulthart, 1993) If cycling were safer then there would be more bicycles to use the dedicated infrastructure, but if the risk of constant interaction with other road users is seen as a safety problem, then, clearly, there is a need for some form of enforcement of any newly-constructed cycle lanes. Extra enforcement needs to be introduced and paid for. Conspicuous signing indicating bicycle priority needs to be put in place. In the most congested locations, such as the central market areas, where all forms of human transport are competing for limited space, only the construction of alternative provision for pedestrians and street vendors will begin to ensure cyclists have priority.

Ownership of a bicycle represents a significant investment for an urban poor household. Reduction of the purchase price of bicycles makes it easier for household members to justify ownership. There is a need not simply to accommodate a suppressed demand, by reducing bicycle costs, as this will merely replicate the gender and cultural divisions within cycle use at present. There are significant variations between communities within Accra towards bicycle ownership and these will not be overcome through purchase price reductions alone. Within those communities that accept cycle use, the cost to the households of earmarking valuable resources for bicycle ownership should be made easier; the lack of access to credit for the urban poor hinders efficient organisation in transport provision. Demand

must also be induced within other communities and sections of the population. Explicit consideration must be given on how to render the bicycle more economically and occupationally useful, in order that people can justify the large call on resources necessary within a household to purchase a bicycle. There is a need to promote cycle use within communities with limited acquaintance of the bicycle and to promote its use by women: sustainability should be accompanied by equity.

Household members are major economic resources within an urban poor household and as motorisation increases, even in those communities that accept cycle use, it will become increasingly difficult to justify the risk cycling places on such human capital. Segregated infrastructure is required to preserve the existing levels of cycle use and allow its promotion in other communities. The special features of mixed road use in Ghana and the overall negative attitudes towards cycling require consideration in the designing of infrastructure. The potential for vendor and pedestrian invasion of cycle facilities, the costs of enforcement and role of signing require explicit consideration in any scheme. It is not sufficient to build cyclepaths or to persuade a substantial section of the public to use cycles on the main arteries of the city. The implementation of dedicated infrastructure for bicycles may require a significant level of enforcement for success, as a result of the negative community attitude towards cycling and the prevalence of the invasion of road space by the informal trading sector. Other road users need to be educated on their behaviour toward cyclists. In the absence of an appropriate infrastructural policy that considers behavioural as well as engineering factors, the admirable goal of sustainability will inevitably be subverted.

4. Designing non-motorised transport into urban use: a Ghanaian, World Bank supported, project.

The Government of Ghana, with assistance from the World Bank, is currently implementing the Ghana Urban Transport Project which has two components that are targeted specifically at the urban poor in Accra. Two studies¹ identified where the poor are located in Accra and the findings showed that the living conditions in those areas were very depressed because of, inter alia, lacking basic infrastructure (water, electricity, roads) and other amenities. As mentioned in Chapter 2, access to low income residential areas is very difficult and sometimes even impossible for motorized vehicles. Furthermore, if motorized transport is being used by low income households, the transport costs represent a high percentage of daily expenditure. Therefore, a majority of low income residents and petty traders primarily rely on walking, bicycling or nonmotorized transport services to satisfy their transport needs.

As a result from the studies, the Urban Transport Project includes two components intended to alleviate the transport burden of the urban poor, benefiting both personal and commercial transport activities:

¹ Urban II Preparatory Studies: 'Accra Residential and Market Upgrading Study', Final Report by Bidex Consult (June 1992), and 'Assessing the Transport and Mobility Needs of the Urban Poor', Final Report by TDP Consult (October 1992).

(i) *Improved access to depressed areas in Accra;*

(ii) *Construction of appropriate infrastructure to facilitate nonmotorized transport.*

The preliminary design report for access roads to some depressed areas² in Accra confirmed the importance of bicycles and pedestrians as a travel choice in those areas:

In all the settlements there were road links where bicycles accounted for more than 20% of the traffic, in some areas even over 35%. The implication of this finding for the design is clear - accord priority to the provision of bicycle paths to encourage the use of this means of travel and to also ensure the safety of cyclists.

The large volumes of pedestrians on sidewalks have also been taken into account to ensure that adequate widths are provided to minimize congestion on sidewalks, particularly during periods of peak flow.

It can be concluded from the foregoing chapters that attitudes towards non-motorized modes of transport differ from very positive to very negative in Accra. This is similar to, for example, Europe where similar variances in attitudes and opinions regarding non-motorized transport exist. Given these different perceptions of non-motorized transport community participation is considered to be crucial to the success of the two project components. After the preliminary design phase, public fora were held in each project location to explain the components and to seek the opinion of residents, i.e. men, women, younger people, the elderly, and community leaders, on the proposals. It was explained that the components were planned to:

- i. *improve accessibility of motorized transport to low-income areas;*
- ii. *enhance the use and safe operation of walking, cycling and push carts;*
- iii. *promote non-motorized transport as a viable alternative to motorized transport.*

The inputs of various stakeholders enabled the preparation of more 'Community Friendly' designs of access roads in depressed areas. For example, speed bumps have been designed to be installed on all roads whose length is in excess of 300 mts. Design speeds of access roads were kept low, between 30-50 km/h, to allow for mixed road use, including the non-motorized trucks and trolleys.

² 'Design of Access Roads to some depressed Areas in Accra', Preliminary Design Report by Comptran, October 1994.

The pilot component to facilitate and promote the use of non-motorized modes will be built upon participation of all stakeholders. This will include local communities, commuters, companies, and the providers of commercial non-motorized transport services. To address the important issues signalized in the first part of this paper, it will be necessary to strengthen the institutional capacity within the Department of Urban Roads (DUR). Technical assistance will be provided to DUR, not only to develop design and construction expertise for non-motorized transport, but also to address the social issues such as organization of user participation, gender issues, traffic education, etc. Main objective of the Urban Transport Project is to assist the Ghanaian government in the development of a transport strategy and policies that are economical, financial, social and environmental sustainable.

In the short term the project focuses on meeting the transport needs of actual users of non-motorized transport. This approach benefits primarily the group of actual users of bicycles and traditional transport modes and those that can be converted by safer operating conditions, i.e. predominantly the urban poor.

Push carts and bicycles are expected to share the new cycle paths to be constructed along main corridors; in residential areas their operation will be facilitated by traffic management measures, such as speed reduction. If direct and convenient alternative routes (such as bicycle paths) are available, pushcarts and bicycles will be banned from main motorized traffic corridors, where their presence results in unacceptable conflicts. The GOB and the Bank agreed that an outright ban of pushcarts will have very negative social impacts: pushcarts form a vital link in the city's transport system and the income they generate supports many large families.

In the longer term the use of non-motorized transport for specific trips will be promoted by addressing the negative attitudes of the population and authorities. DUR, through its NMT coordinator and using participatory mechanisms will initiate the discussion on, inter alia, gender issues, harassment of truck boys by authorities, and collection of NMT accident data. DUR will also initiate the development of traffic education and training courses, in close collaboration with other stakeholders, such as the Ministry of Transport and Communications. Greater use of bicycles will contribute to reductions in urban noise and air pollution, congestion, and automotive energy consumption.

The project approach is expected to attract a high visibility, thus further expanding awareness of the importance of non-motorized passenger and freight transport in the minds of policy makers, planners and the general public.

5. Conclusion: non-motorised transport, an appropriate option for a developing economy.

As we have seen non-motorised transport persists in a context where prevailing official values operate against its presence. Other road users, in line with the majority of official and professional perceptions of the outdatedness of non motorised transport, discriminate against users of the mode in such a way as to endanger their safe operation. Where collisions occur this has negative economic consequences, let alone loss of life and personal grief. Given the current high level of accidents and as non motorised transport is unlikely to disappear, there is a need for rethinking on the ways of improving traffic safety, first of all by protecting the group of most vulnerable road users, i.e. pedestrians and bicyclists. Sustainability of current transport systems is also threatened by its high costs and negative environmental impact, both primarily affecting the poorest segments of the population. In order for non-motorised transport to make its fullest contribution to the transportation of goods and to the economy in the petty trading structure of Ghana, it is necessary that the harassment of truck boys by officials, as evidenced by our respondents accounts, be discouraged. Similarly, other road users must be educated to see the value of this transport sub-sector and required to respect its safety.

Much of the discussion, such as there is, about the future of non-motorised transport assumes that this mode of conveyance is transitional, however, the evidence from both Accra and many industrialized countries suggests that this is not the case. Increased congestion and environmental pollution as a consequence of increased motorisation generate the conditions conducive to the persistence of non-motorised transport, for non-motorised transport is faster, more energy efficient and cleaner than motorised transport over short distances. Furthermore, the existence of an extensive petty trading structure which depends upon the provision of low cost transport supplied by the non motorised transport sector coupled with the physical design of the trading districts which necessitates the use of smaller vehicles than that suppliable by motor transport ensure that the trucks and trolleys of Accra will outlive the existing policy makers antipathy towards the mode. There are few reasons then to suppose that non-motorised transport is a transitional form. As it seems unlikely to disappear it must be recognised as part of the existing transport structure and brought within the scope of urban transport planning in the developing context. DUR and the Bank agree that transport planning for the city must include planning and appropriate facilities for the efficient operation and development of the non-motorized sub-sector rather than simply try to squeeze traditional transport out of existence (Okpala, 1977).

There are a number of measures which could usefully be adopted to improve the operation of non-motorised transport. Firstly, the semi-official and the informal interference of authorities with this mode of operation should be discouraged. Such interference, our evidence suggests, may dissuade traders from making use of the mode as a consequence of the negative effects such interference has on the reliability of their trade. Secondly, segregated road space could be made available for such trucks and trolleys, especially in the central trading districts. Such a measure would help provide the non-motorised sector with a more

positive image and thus reduce harassment it presently experiences from both motorists and municipal and other authorities.

Similarly, if the promotion of cycling as a sustainable mode of transport for the third world is to be gender equitable, attention should be paid to ensuring the access of females to this mode. In Ghana, the scale of the female petty trading sectors, with its small load requirements, could provide a fertile ground for a sustainable non-motorised transport policy. Gender barriers to cycling in all communities mean that if mass non motorised transport is promoted and women continue to have highly limited access to bicycles, women will be pushed back even further on to their own two feet. The promotion of cycling should be designed so as to alleviate and not intensify this. The success of a sustainable transport policy for Ghana is dependent on effecting a change in behavioural attitudes towards cycling amongst both population and municipal officialdom as well as upon the construction of appropriate segregated facilities.

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