

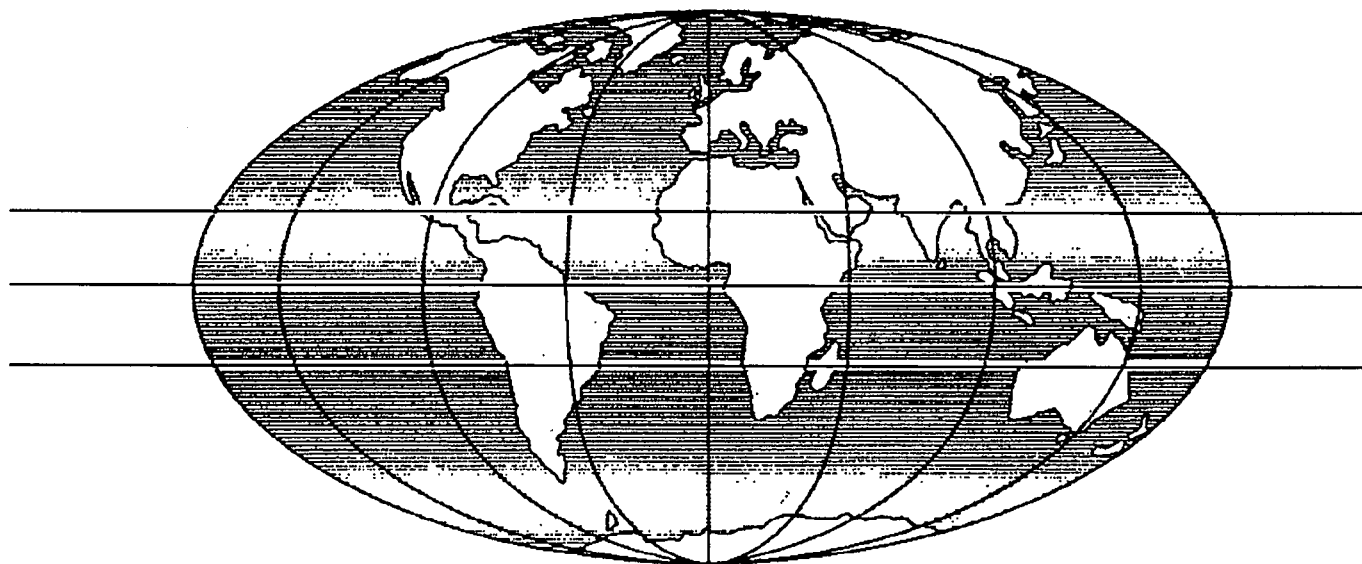


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Reprint

TITLE Women and transport in developing countries

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TURNER, J and P FOURACRE (1995). Women and transport in developing countries.
Transport reviews, 15(1), 77-96.

Women and transport in developing countries

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Transport is an essential element in women's lives. It determines access to a range of essential resources and activities such as employment, health care, education and child care. The purpose of this paper is to review what is known and to assess, in general terms, whether and how transport could contribute more positively to women's interests. The paper examines the roles of women in society and identifies the ways in which transport impinges on these roles. Quantitative evidence is presented on the way in which women use transport and some of the short-comings of transport, in this respect, are identified. The question of whether women's role or potential in society is restricted by the state of transport cannot be answered by what little information is available, though there are strong grounds for believing that there is a link. What is clear is that most planning and development decisions are undertaken by men with little or no regard paid to women's needs. This is an area where there is a need for more basic data and case study material on how women make use of the transport system, the differential impacts of transport on women and what opportunities are denied to them when the system cannot meet their needs. In establishing that a problem exists (i.e. poverty of access to job opportunities) it also has to be established very clearly the extent to which transport causes or contributes to the problem as opposed to other factors like land-use development or social and cultural practices. There is a need for a greater awareness throughout all aspects of transport—engineering and planning, urban and rural—of its development impact on the triple role of women in society. The inclusion of more comprehensive gender-awareness into all fields of transport research can help to explore ways of correcting bias, and provide a sounder basis for policy advice.

1. Introduction

Gender issues are an increasing concern of the international aid agencies (for example, Grieco 1991, Pearson 1992). The years 1976-85 were the UN's 'decade for the advancement of women' from which there has developed, amongst leading multinational and bilateral development agencies, a new emphasis on policies designed 'to enable women both to enjoy the fruits of development, and to make an appropriate and necessary contribution to the development process' (Pearson 1992). The Overseas Development Administration (1989) have noted that 'the obstacles to the full participation of women in development form one of the greatest challenges in international aid'. Many Third World governments recognize that development is hampered while half the population is unable to participate fully in economic and social activities; they are increasingly looking to ways, usually within their cultural traditions, to promote the role of women to achieve the full productive potential of all society. Again quoting the ODA, 'to achieve a better deal for women is, at one and the same time, a major step towards relieving poverty, a broadening of social opportunities and a stimulus to economic development'. It is therefore relevant to examine women's interests in transport development as part of this increased awareness of women and development. This is appropriate as transport is an essential element in women's lives.

It determines access to a range of essential resources and activities such as employment, health care, education and child care (Hamilton *et al.* 1991)

The success of transport in meeting women's needs and the unexpected impacts that transport development may have on women's lives are poorly understood and documented. The purpose of this paper is to review what is known and to assess, in general terms, whether and how transport could contribute more positively to women's interests. The paper examines the roles of women in society and identifies the ways in which transport impinges on these roles. Quantitative evidence is presented on the way in which women use transport and some of the short-comings of transport, in this respect, are identified; some less-obvious impacts that transport developments can have on women's interests are also identified. The paper concludes with a discussion of how transport could be developed in a more neutral manner towards the sexes, and some of the problems of achieving this.

Overall, the paper addresses four key questions, using current knowledge:

- (a) whether transport (*per se*) restricts women's role in society or women's potential in society;
- (b) whether transport has any differential impacts on, or is any less 'user friendly' to women than to men;
- (c) whether women are denied access to job opportunities in transport; and
- (d) taking account of the extent to which the first three questions can be answered, what further research is required.

2. Women and society

Transport is a key process in any society and as such cannot be isolated from the society around it (Grieco *et al.* 1989). To examine the impact of transport on women's lives, it is necessary to be aware of women's roles in the society that determines the transport system, as well as assessing how women actually use transport to fulfil their roles. While these roles vary between societies, classes and ethnic groups, there are many common role features which can be used as a framework to explore the effects of transport development on women carrying them out. Furthermore, these common features extend across both developed and developing societies.

The commonality in the roles which societies assign to women are threefold. They are of production, as workers; of reproduction, responsible for child care and managing the household; and as community managers, responsible for maintaining community and social networks, and the local environment. Even in societies where formal legal equality may exist men and women do very different work. The tasks which are considered 'women's work' or 'men's work', and even which tasks are considered worthy of remuneration, differ between societies, but again there are commonalities between societies in this 'sexual division of labour'. Some division may be accounted for by the practical needs of the job, but many differences stem from the perceptions of a male-dominated society. The result is that women are assumed responsible for child care and the well-being of the household, including its health, education and housing. It is also assumed that women should undertake a community management role.

These role models for women are used throughout this report as the framework to explore how the management of the transport system and the assumptions that underpin its development affect how women use transport, how they are prohibited from or inhibited in its use, how its operation affects their everyday lives and their ability to change it.

2.1. *Women as workers*

Published statistics on employment rates and economic activity rates give some indication as to the relative roles of the sexes in the labour force. It is quite apparent, however, that 'much women's work is statistically invisible' (Wield 1992). Invariably, the statistics are unable to capture the extent that women work in agriculture in rural areas. This is because much of this work is unpaid family labour in assistance to a male partner or relative, or alternatively carried out in subsistence farming (Momsen 1991). The statistics also under-record activities in the informal sector where there may be no formal workplace or where work is done at home; many women, particularly those in cities, are concentrated in these activities.

Reported economic activity rates of women tend to be about half those of men (Wield 1992), though there is wide variation between developing countries. This probably partly reflects different degrees of under-reporting which, as already noted, is particularly prevalent in agricultural areas and, 'to the extent that the amount of agricultural work performed by women is greater in the poorer strata of the peasantry ... it implies that this underestimation differs according to class background and affects women from poorer strata to a higher degree' (Beneria 1982).

Momsen (1991) states that 'some 70 per cent of women living in rural areas of the developing world work on the land'. She also noted that they are most likely to be agriculturalists in the poorest countries; the female participation rate in the agricultural labour force varies from almost half in sub-Sahara Africa, Asia and the Caribbean, to less than 20% in Latin America. While most women in rural areas are involved in agriculture, relatively few have ownership of their own farms.

Time budget studies have shown that men invariably do the mechanized tasks of ploughing and adding fertilizer, while women do the less skilled, more time-consuming tasks of weeding, livestock maintenance and the transporting of both inputs and crops (Momsen 1991, Riverson and Carapetis 1991), as well as paid labour on other farms. These studies have also shown that women in parts of Africa work up to 50 more days a year than men on farmwork, despite needing to spend time carrying out all the other tasks and roles of women in a rural environment.

In addition to agricultural work, women throughout the developing world often take responsibility for retail trade in rural produce. This is particularly so in Africa and the Caribbean; for example, women make up 93% of market traders in Accra, 87% in Lagos and 60% in Dakar (Momsen 1991).

Women also work as petty commodity producers or in the production of items on contract for factories (outwork) in both rural and urban areas. The work is poorly paid and offers no security; however, the non-agricultural sector can be important to women in the rural environment in that it provides an element of survival against the vagaries of agricultural production and poverty (Dennis 1991).

Momsen (1991) reports that in the urban sector females make up between 12% (Arab countries) and 35% (Latin America) of all people employed in non-agricultural work. Women have generally been moving out of agriculture into industry faster than men, and in some fast-developing economies (in S.E. Asia, for example) the share of women in the manufacturing labour force is more than 40%, some 10% more than any industrialized market economy. In these economies, industrialization has been as much female-led as export-led; trans-national companies have benefited from both the low-wage expectations of women and the incentives of 'free trade zones'.

Most working women in urban areas are concentrated in the service sector in occupations that are often little more than an extension of their reproductive tasks

(e.g. food produce traders, domestic staff). Women make up 27% of the service workers for the Third World as a whole and 39% in Latin America where 70% of all economically active women are service industry workers (Momsen 1991). Here again women are confined to the lowest-skilled, lowest paid work. Lack of access to formal-sector employment restricts their ability to obtain marketable skills with which they can set-up as artisans (MacEwan Scott 1991).

2.2. *Women as reproducers*

Reproduction can be split into biological and social functions. Biological reproduction is the female role of childbearing and breastfeeding children. It is also naturally assumed that women undertake the more general tasks of child care throughout the childrens' lives, even though men can undertake these latter tasks as well (Elson 1991). Social reproduction is classed as the activities carried out to maintain and care for family members (Momsen 1991). This includes food preparation, education of young children, child care, health care and fuel and water collection. These tasks are the burden of women throughout the world.

At any one time it is thought that one-third of all women in the less-developed countries are either pregnant or lactating (Momsen 1991). The fertility rate (the number of children that the average woman will bear during her lifetime) is broadly related to development; it is significantly higher in the developing world than in the West, although there are considerable spatial variations both between and within countries. For example, fertility rates tend to be lower in cities; reasons for this may include the fact that services (like family planning) are more accessible in cities and that the cost of raising children in cities is high by comparison to rural areas (Economist 20.1.90). There is also a burgeoning middle class (in many Third World cities) whose preference seems to be for smaller family size. Furthermore, women who move to cities are likely to become better educated and achieve some small increase in financial autonomy and power to resist male sexual violence (Jacobs 1991), which may also have a bearing on lower city fertility rates. Culture and religion also play their part in determining fertility rates.

The tasks carried out as social reproduction are largely concerned with the management and organization of the household. The household is assumed to be a co-habiting unit that shares and pools income and has aspects of common consumption and production. Largely through cultural tradition it is common in most households that social reproduction tasks fall on women. Extended households tend to reduce the burden of these tasks in both time and effort, as the women of the house share tasks. Female-headed households, of which there are an increasing number in parts of the developing world, also tend to share tasks more evenly amongst household members. Access to independent sources of income or land also tend to alter the onerous nature of social reproduction (Jacobs 1991).

Social reproduction tasks consume a lot of women's time and energy the world over. A number of studies have demonstrated how women generally spend more time than their male counterparts doing both paid work and domestic chores (for example: Momsen 1991, Riverson and Carapetis 1991, Joss 1990).

2.3. *Women as community managers*

Women have, as a third role, that of community managers. Men are involved in local community affairs in a community leadership role which is organized within the formal.

national political system. Women have a role based on the management and provision of items of collective consumption (Moser 1989). They are often responsible for the maintenance of wells and sources of fuelwood, because of their responsibility in collecting these items. For example, the success of one well maintenance project in Zimbabwe was dependent on the involvement of women in the formal institutions that planned, built and maintained them (Cleaver 1991). They are also often responsible for the provision of housing in many societies, both traditional as in the Masai tribes of Kenya and in urban centres.

Women are also managers of social networks for the community as a whole. These they maintain as part of women's strategies for survival. Through these networks they can for example: gain access to capital for income-generating activities, common in parts of West Africa (Dennis 1991); get loans to overcome financial hardship and have opportunities to share social reproduction and child care tasks (Momsen 1991, Grieco 1991) allowing women to work or perform other activities.

As a result of their role as community managers they take an active role in demanding improvements in their community (Moser *et al.* 1991) or carrying out the improvements themselves (Momsen 1991). They also have a vested interest in their immediate local environment. Sontheimer (1991) discusses many case study initiatives that demonstrate how women have been able to maintain their local environment.

In their role as community managers women, especially those from the low-income community, take a leading role in providing or campaigning for the provision of communal services (water, housing, sanitation, schools, etc.). Van Wesemael-Smit (1990) provides a detailed account of women of the low-income *barrios* of Lima, Peru. The women of the community played leading roles in the struggle against the authorities for land, basic services such as water and electricity and social services, such as health clinics. This involvement included marches against the authorities and providing the active membership to the community organizations. Despite this, the men of the community held the positions of formal power in these communities and the authority's dealings with the community were directed through them.

In a self-help project documented by Moser *et al.* (1991) in Ecuador there is evidence that concentrating community involvement solely in the hands of the males may result in project failure. The community succeeded in obtaining infrastructure in exchange for promising votes in the formal, political elections. The community therefore needed to maintain a high membership level if it was to maintain its bargaining power with the politicians. The most regular attenders were women and 'where men did attend, their participation was neither regular nor reliable and was often undertaken after considerable pressure had been applied by both the committee and the women'. The study goes on 'Political party leaders, administrative officials and the men of the community all saw it as natural that most of the participatory work should be undertaken by women: "women have free time while men are out at work" ... time spent in mobilization was detrimental both to domestic and productive work and women made considerable sacrifices, often risking their jobs as well as neglecting their children in order to participate.' The study concludes that self-help programmes rely substantially on community participation, i.e. on the participation of women. 'It also shows that women participate with clearly defined objectives relating to needs which are required by all the family but which women in their reproductive, productive and community-managing roles see as their responsibility to provide' (Moser *et al.* 1991).

3. Women's use of transport

Section 2 has established the general framework of women's place in Third World society; a key component in the way that society functions and develops its transport. In this section, the ways in which women make use of transport are examined, while in the subsequent section the impact of transport development on women's progress is explored.

3.1. Travel patterns

The roles that women have in society must inevitably have a powerful influence on their travel patterns, though there is little documented evidence which clearly demonstrates this. One can speculate that in their role as biological and social reproducers women are likely to be closely constrained to the household, with travel being governed largely by the need, in urban areas, to have access to education, health care and shopping facilities. In rural areas, access to water and fuel supplies will also be important in determining travel patterns associated with the role of household management. Furthermore, the fact that women often have to combine this reproduction role with some form of employment must affect their potential range of travel to work: for example, management of the household may require women to be available at their children's school, both at its start and finish, thus severely restricting their available working time and job opportunities.

The relative importance of the roles which a woman undertakes may vary through the life-cycle and this will be reflected in changing travel behaviour. This was demonstrated in the U.K. by the work of Jones *et al.* (1983): they defined eight family life-cycle groups, based on family structure and age, and showed how both household and individual travel patterns varied over the life-cycle groups. Women's trip characteristics show marked changes as they shift from younger married adults without children to families with pre-school children and school children, whilst men's trip-making was found to be relatively stable over the family life-cycle. During this period female work trips are significantly reduced, while 'other' trips (e.g. for child and health care) take on extra significance. The life-cycle groups are broadly age-related and thus, not surprisingly, travel behaviour exhibits similar patterns of change when analysed by age group. Grieco *et al.* (1989) demonstrated the major shift that occurs in travel characteristics for women in the age range 21–59, when many take on child care responsibilities. The application of life-cycle grouping to the developing world is undoubtedly much more complex: the structure of the family and its extended household, diverse cultural and religious attitudes, the informal nature of much employment, and the gainful employment (both at home and at the work-place) of both the very young and very old. All of these factors, together with age and income (the main components of the life-cycle groups), may have a more important role in determining women's travel patterns in developing countries than is the case in the industrialized world. Pilot studies conducted by the authors in Accra indicate that large, extended or polygamous households use junior females or female children to carry out housework, child care and home security tasks, thereby allowing other, more senior women to go out and make longer journeys for employment and trading purposes.

There are few urban travel studies of the Third World which have specifically identified women's trip-making. In a study in Brazil (Schmink 1982), it was shown that women's trips to work accounted for only one-third of all work-related trips. There were important differences in the location of the workplaces of women and men. Only 17% of women were employed in industrial areas compared to 40% of men; 36% of all

employed women worked at home or in their local neighbourhood compared with 15% of men. Schmink also found that women were responsible for at least half the non-work trips. Of the trips out of the neighbourhood, 41% were health-related, 19% were to get household provisions and 19% were of a social nature. These trips are invariably made 'off-peak'. As studies of women's work patterns in rural areas have shown, the pattern of activities is one of constant competing demands on women's time. Continuous multi-tasking makes up the average woman's workday. Child care and housekeeping responsibilities constantly impinge, often reducing mobility and the opportunity to travel long distances and increasing the frequency of trips made (Skjonsberg 1989). The complexity of scheduling in a woman's day allows for little flexibility to cope with long waiting times or irregular public transport and increases the need to fulfil several activities within one journey, i.e. trip chaining. Studies in the West indicate that women are more likely to 'trip chain' than men (Rosenbloom 1989). Given the way that many transport systems function, trip chaining can be difficult to organize, time-consuming and costly, but a necessary inconvenience.

Urban sprawl, increasing land-use specialization and the resultant dispersal of jobs, are changing travel patterns in cities (Levy 1991). Allied with this is a change in the spatial distribution of income. The urban poor are increasingly situated on the periphery of cities where access to city facilities and job opportunities is restricted (e.g. Fouracre and Turner 1992). In four Brazilian cities Schmink (1982) recorded average earnings which were 30–50% lower in peripheral areas; these areas are poorly linked to the main arterials. The resettlement of Delhi's central area squatter colonies on cheap peripheral land had a detrimental effect on low income people's opportunities, particularly for women. The ability of women to get to work from these new locations was disproportionately affected compared to that of males: female unemployment rose by 27% compared to a 5% rise for men (Moser and Peakes 1987).

Women's travel behaviour in rural areas is perhaps better documented, particularly in Africa. Studies show that the vast majority of trips are internal to the village and on foot. One study reports 80% of all trips were internal and out of area longer distance travel accounted for only 0.6% of trips. The vast majority of trips are for the provisioning of basic needs for the household (Howe and Barwell 1987). Rural areas exhibit some similar patterns (to urban areas) of spatial distribution with associated access problems for the poor, and women in particular. For example, in Zimbabwe the poorest households are to be found on the most marginal land, furthest from markets and sources of agricultural input (Jacobs 1991). In addition women, providing food for the family through subsistence farming, are often allocated the poorest fields furthest from the village, increasing their daily travel distance (Bryceson and Howe 1992). A study of the impact of the Thuchi–Nkubu road in Kenya emphasized the connection between women's travel and their societal roles (Airey 1990). The study only covered travel by vehicles (including bicycles), and hence has a bias to longer trips; however, it does show how females make most of their long-distance trips in connection with health and trading. Here also, findings showed that women are much less likely than men to make vehicular trips, i.e. women's trip making is most likely to be confined to the local area.

3.2. Mode choice

Most low-income households do not have access to personal vehicles and even where they do the male is most likely to have priority in its use. This happens by virtue of the 'natural' order of household gender relations, and also because women are far less likely to be licence holders (which itself may also be a reflection of gender relations

within the household). In London only 34% of women have a licence to drive a car, and of these, two thirds (23% of all women) have access to a car for only part of the time and another 11% have no access at all. Thus 70% of women are always dependent for their travel needs on public transport, walking or on car drivers (to give lifts). In practice, 43% of women's trips were undertaken by car; but clearly, many of these trips must have been as a passenger. Over 50% of men's trips were undertaken by car and half of men in London have a car available (GLTS 1981 and GLC 1985).

There are few comparative figures for a developing city, but there can be little doubt that women are equally disadvantaged by comparison to men. A study in Nairobi found that 9% of female-headed households used a private car compared to 24% for male-headed households (Nairobi City Council 1984). Comparative proportions reported in Belo Horizonte, Brazil were 6% and 23% respectively (Schmink 1982). Women's dependence on modes other than car is seen in their greater use of bus compared to men. In Nairobi, 66% of women's trips were made by bus compared to 56% for that for men. In Belo Horizonte the proportions were 63 and 53% respectively.

Judging by the types of journeys that men and women have to make, it might be expected that there would be a notable gender difference in walk trips. Walking, despite its importance, is a mode of travel not often measured consistently and accurately (even in the U.K. where only walk trips of more than 1 km are recorded in the National Travel Surveys); in some studies it has been ignored almost totally. Hence, comparative data on walk trips by gender is particularly thin. In London almost one third of women's trips (in excess of 10 minutes) were by walk, compared to 20% for men. In African cities walking is the predominant mode of transport. For example, in Addis Ababa 79% of daily trips of the poorest income group were made on foot (Kranton 1991). In Nairobi, 27% of female-headed households made all their trips on foot compared with 15% for male-headed ones. In Recife and Sao Paulo, walking to the bus stop accounts for 25% of travel time and, as already noted, women use buses more than men and hence incur this added penalty of bus travel.

Cycling is a very common form of transport in some Asian and African societies, but its use by women is limited largely to pillion passenger or as passenger in cycle rickshaws. Women have neither the purchasing power to acquire a bicycle (which in the case of rural Tanzania costs the equivalent of almost a year's minimum wages. Bryceson and Howe 1992), nor (in many cases) the social acceptance of riding a bicycle. Both these points have been highlighted in a number of studies (Howe and Dennis 1993), including recent work by the authors in Accra.

Head and back-loading constitutes a major form of transport across the developing world. In two World Bank/ILO sponsored studies, two rural communities in different parts of Africa were surveyed to assess the level of human transport effort used. In a village in Ghana, an average of 11.9 hours per member of household per week was occupied transporting things. In the other site in Tanzania, this figure was 15.4 hours per household member per week. However, this burden is not spread evenly through all members of the household (Howe and Barwell 1987, Barwell and Malmberg Calvo 1989). Load-carrying is typically carried out by women and children. In Tanzania trips by women account for 70% of all transport time and ton-km carried (Barwell and Malmberg Calvo 1989). In the Ghanaian study, men were found to spend only 35% of the time and exert only 25% of the load-carrying effort of women in transport activities (Howe and Barwell 1987). McCall (1985) also reports that women almost exclusively transport water and fuel in addition to the movement of harvested crops from the fields. Bryceson and Howe (1992), in reviewing their own and other findings about rural

head-loading, point to the onerous nature of the work, and its adverse impact on women's health. Findings from the authors' recent work in Accra amongst urban women who provide services as headporters or *kayayoos* in the markets, point to the use of modern medicines, such as valium, by these women to relieve the strain of such arduous carrying tasks.

Again, low-income peripheral communities encounter particular problems in respect of mode choice; because these areas are dispersed, they do not always generate the high traffic flows which are needed to justify investment in cheap public transport. As a result, low-income people may have to walk long distances to link into the transport system. As much of Africa's road infrastructure still follows the colonial network which concentrated on transport between the primary production areas and the port or city, movement for women marketing agricultural and food produce between the rural area and the secondary urban centres is complicated by the lack of good infrastructure or transport services.

4. Transport impacts on women

4.1. Transport planning

Transport planning has a set of assumptions and procedures which have predominantly been developed in the Western world. These practices are becoming increasingly commonplace in the developing world, as transport authorities become more professionalized, assisted by the spread of Western transport consultants' involvement in transport development and the exchange of ideas through the training of developing country professionals in Western universities. Western transport planning practice has been criticized for its gender bias (Rakodi 1991) and there is little doubt that this bias has been transferred to the Third World. Some aspects of this are discussed below.

4.1.1. Household as the unit of analysis

The household is a major unit of analysis in transport demand. It is assumed to be a co-operative, decision-making unit, which shares resources. It is also assumed that benefits to (male) household heads will 'trickle-down' to other members. However, some studies suggest that while women typically pool and share their income, especially with their children, men tend to reserve part of their income for discretionary personal spending.

Travel surveys treat 'head of household' travel as the most important in the household (Levy 1991). There is an implicit assumption that heads of households are male and workers, and hence the main contributors to peak-hour travel demand (which itself is seen by many transport planners as the main focus of transport development). However, the travel demands of other household members at other times of the day may be just as crucial to the overall welfare of the household.

It is also the case that household heads are increasingly likely to be female: 30% of all households across the world are now female-headed (Sontheimer 1991) and this proportion is significantly higher in many regions of the world. These households are invariably some of the poorest in the community; as women are the primary income-earners in these households, their ability to gain access to income-generating activities as well as to fulfil their other roles is of paramount importance (Levy 1991).

A wide range of other non-nuclear family structures exist. Some may be traditional structures such as polygamous households; others may be migrant worker groupings.

without children. Many will also contain elderly people, a neglected but increasing grouping, especially within urban areas of developing countries. Even those of a more stereotypical 'nuclear' form are likely to have more younger children than traditionally assumed in the West. All these factors make for a wide variety in travel patterns, a variety which is underestimated by the usual approach to estimating travel demand.

4.1.2. *Cost-benefit analysis*

Cost-benefit analysis uses market prices in its valuation procedures (Kabeer 1992). This assumes that costs and benefits can have opportunity costs as a result of the operation of a competitive, free market. Any imperfections in this 'free market' are dealt with by shadow-pricing techniques. These, however, rely on alternative 'undistorted' prices being available for comparable goods. Given the sexual division of labour prevalent throughout the world, there is no free market that does not have gender bias: that does not value female productive labour lower than men's; that does not concentrate women's labour unproductively in a few unskilled occupation groups and that does not ignore women's other roles in society by not valuing them at all.

In valuing non-marketable goods, cost-benefit analysis also has biases. As Kabeer (1992) points out, 'it is generally true that the poorer the nation, class or household, the more critical is the role of self-provisioning and other non-market activities to its survival'. Much of women's labour is extended into activities for which market's do not exist. Reproduction and community management roles are not valued. Estimated crudely, by calculating the cost of buying in the equivalent goods and services, these activities would contribute to an increase in the GDP of most countries by 25–30% (Appropriate Technology 1992).

The adaptation of the cost-benefit analysis process from strictly addressing efficiency issues to dealing with questions of the equity of the distribution of costs and benefits to groups in society also has weaknesses. This adaptation is achieved by placing weights on costs or benefits relative to which groups in society are to them. The assigning of these weights is a 'political' decision which is influenced by the biases of politicians, bureaucrats and professionals who are involved in the decision-making process. Whilst this is inevitable, the assumption that cost-benefit analysis is some form of 'neutral and benign decision-maker entrusted with the task of measuring project costs and benefits in terms of the social welfare' (Kabeer 1992) is open to question.

In cost-benefit analysis, 'non-working' time (including travel to and from work and leisure time) is valued considerably lower than wage rates; most of women's travel in connection with their reproductive and community roles would normally be included under this heading and valued accordingly. However, given the evidence already presented of women's daily time use, there is a strong argument for valuing women's travel time (associated with household work) at a higher level than that ascribed to non-working time.

In the same vein, the inclusion of accident costs on the basis of lost marketable output and the cost of health care, mask the non-valuation of both women's health care role and women's reproductive tasks.

4.1.3. *Mobility not accessibility*

Transport is a derived demand. For passenger transport, it is the ability of people to gain access to activities without undue expenditure of time, cost or effort that marks the real test of the system (Thomson 1974). Transport planning tends to concentrate

primarily on mobility—the movement of people as a means in itself, increasingly over long distances using complex technologies. The reason for this may not lie entirely with transport planners; in many cases the urban transport planner has little choice than to conform with the dictates of urban planning whose land-use developments take little account of transport problems and constraints.

A bias towards mobility is seen in the data collection methods used throughout transport planning. Most survey techniques involve the recording of movement volumes, mostly of vehicles. These are used as measures of system performance (Hounsell 1989) and are biased towards journey-to-work movements in morning and evening peak hours. Accessibility measures are infrequently developed and seldom used in practice.

The problem with planning for mobility is that it tends to focus attention on improving the conditions of those who are likely to be more mobile already i.e. the owners of personal vehicles. These are likely to be male and (except in the case of bicycle and motor-cycle owners) from higher income strata. In doing so, it also inevitably focuses on peak travel periods when even the most mobile traveller (the male car user) has access problems because of congestion. Access problems exist equally in the off-peak for the low-mobility female trying to get to a hospital or a market, or, indeed, trying to get to a job; ironically access may even be worse in the off-peak, when congestion is minimal, because of a general withdrawal of public transport service. In the case of a woman trying to get to a workplace in the off-peak, her time constraints may be crucial; but transport systems are rarely geared to this type of problem. Grieco and Pearson (1991) show evidence of how women in low-income communities, albeit in the U.K., rely on relations between households, neighbours and relations, to overcome time constraints by exchanging 'time' or tasks so that out-of-home activities can be undertaken. As mentioned earlier the authors' pilot studies in Accra point to similar processes being used in large extended households.

4.1.4. Community participation

Transport planning is seen largely as a purely 'technical' exercise (Levy 1991) with the goals and objectives set externally by some formal political structure. In the developed world transport planning has been increasingly politicized as a result of pressure from the community affected by the planning process. As a result, newly formed pressure groups have begun to find ways of influencing the transport planning decisions of the formal planning process. There is no evidence of such efforts having really worked in the developing world.

Efforts have been made in other professional disciplines to involve the communities which they intend to serve and it has become clear that in doing so there is a need to take account of gender issues. For example, many low-cost housing projects started by aid agencies in different parts of the world have failed to achieve desired objectives through a lack of gender-awareness. A USAID project in Quito, Ecuador, initially had 25% of all applicants from women-headed households, although only 9% had sufficient to make the down-payment. Once the down-payment was reduced the number of households in this category increased significantly (Rakodi 1991). Other self-help projects have involved providing communities with materials to construct their own dwellings only to find that women's inability to contribute precious time to unpaid housebuilding work has affected the number of people eligible to benefit from the projects.

4.2. *Traffic safety*

The gender differences in travel patterns, behaviour and mode choice expose men and women to different traffic accident risks. The differences in exposure are not, however, well researched or understood; thus for example, while U.K. male adults (over 18 years) are more likely to be traffic pedestrian casualties, it is evident that women have a higher walk rate (measured on any scale—mean time spent walking, mean distance walked, mean number of roads crossed). A study by the OPCS (1980) explained this difference by attributing men with a higher risk-taking behaviour when crossing roads. Evidence from LDC's equally appears to show women have a lower rate of pedestrian fatality than men. Women in Ghana have one of the highest rates at 40% of all pedestrian fatalities, whereas the more typical rate is 30% and some countries, such as Pakistan, are as low as 20% (Downing 1991).

Due to the lack of investment in the public health system in most developing countries, much of the cost, time and effort of caring for accident victims will fall on the women of a household. The disruption caused by the need for extra time caring for the accident victim and the need to somehow find time for extra income-generating if the victim is a wage-earner, will add undue burden to an average day that, as previously noted is already a complex web of competing demands. Even where the victim is a female of the house it is often accepted in some societies that the household tasks fall to other female relatives, who have to fit them in with their own time demands.

There are also disbenefits that accrue disproportionately to women, children and the elderly from the *perceived* risk of accidents. Studies in the West have found that these groups are more inclined to limit or reduce their trip-making if there is a perceived risk attached with the trip (Davis 1992). This will result in a reduced accessibility of these groups to desired or even essential activities. Travel can also be affected by perceived risk of other dangers, particularly attack on public transport. Evidence from South America suggests that low-income women from the peripheral areas of cities in this region, perceive a high risk of theft and sexual assault, and hence are reluctant to make very long bus journeys to the city centre without an escort (Anderson and Panzio 1986).

4.3. *Travel quality*

The general quality of travel for the mass of transport users throughout the Third World is poor. Travel by bus or para-transit can be an uncomfortable experience, even during off-peak periods when crush loadings are not apparent. Observation suggests that many women will avoid any attempt to board a heavily loaded bus; they will rather wait for a less-crowded bus and the opportunity of getting a seat. In some countries (particularly in the Near and Middle East) operators go to the trouble of allocating some buses for women only, or provide reserved seats for women on all buses.

Apart from the problems of crush loading (and its attendant hazards of sexual harassment or so-called 'eve-teasing'), women (and the aged and infirm) probably suffer more seriously from the poor design of vehicles and the way in which they are driven. For example, the height of entry steps and absence of hold rails present particular problems to women in traditional everyday dress (like saris) and women with shopping and/or young children. Bus drivers are not noted for paying heed to their passengers' comfort: dangerous and excessively fast driving are common, as is the practice of over-shooting bus stops causing general pandemonium in the passenger queue (if it exists), usually to the detriment of any waiting women.

Market traders (often mostly women in some areas of the world) have particular problems as to the type of vehicle which they can access, because of the bulky nature

of the commodities they may be transporting. Evidence from a recent survey in Accra undertaken by the authors suggests that traders will often avoid boarding certain types of passenger vehicle (particularly high sided 'mammy wagons') because of concerns such as the security of their load: as a result, their waiting times are adversely affected.

More modern and comfortable public transport is beginning to find its way into some developing countries, but usually at a premium price. These systems may also have other disadvantages; metros, for example, provide a high quality of travel (speed, comfort and often air-conditioning), though access may be restricted by the need to negotiate stairs, escalators and long pedestrian walkways. Again, it is women, the aged and infirm who will find the greatest difficulties in negotiating these problems.

4.4. Environmental impact

Within transport planning the usual assumption is that the environmental effects of transport development will be the same for the whole community. However, given their reproductive and community-managing roles, it is women who often experience a disproportionate amount of the impact of road transport development.

The environmental effects of transport are numerous (Appleyard 1986) and range from noxious gas emissions (some of which may contribute to global warming), to community severance; from noise pollution to increasing stress levels and from causing accidents to destroying aesthetically beautiful countryside.

Road transport contributes some 14% of all carbon dioxide emissions, and there is an upward trend to this contribution. If global warming is a real phenomenon, then transport is evidently a major contributor. The impact of global warming is uncertain but, if it results in increasing desertification, continuing water shortages, loss of fuelwood resources and ever increasing scarcity of food, the increased burden of family survival will largely fall on women (Sontheimer 1991). Men will migrate increasingly to the urban centres as rural subsistence farming becomes less sustainable; women are left behind and must devise survival strategies as a result of their need to care for children and older household members (Dankelman and Davidson 1991).

Other emissions have a more local effect but may still provide an extra burden for women. Road transport produces large quantities of pollutants, from lead which is a cause of brain-damage to children, to a cocktail of gases that cause respiratory diseases and, when mixed with sunlight, smog. These may reduce the productive capability of the population, lowering household income, which as a result of the power relations within households increases the financial burden on women. Also women are entrusted with the health care responsibilities of such effects; this in situations of poverty, where disease is already prevalent and health care facilities rudimentary.

The construction of roads, both in rural and urban areas, has significant environmental effects which may have an adversely differential impact on women. In semi-arid rural areas the road-making materials and water may be removed with unforeseen consequences for local communities: water supplies may be affected; top soil and stone excavation for road building may alter local drainage and erosion prevention systems can hasten the onset of desertification. This latter is particularly significant in very hilly tropical terrain where the slightest alterations may drastically affect water run-off and contribute to large mud-slides. In societies where women participate as providers of subsistence produce and collectors of water, such small changes in the ability of the land to support agriculture can have dramatic effects on the women's ability to support households.

Urban road construction and growth in traffic may affect social networks through community severance. Research in the West has demonstrated this impact: as traffic volumes increased, women reported knowing fewer and fewer people across a busy arterial. This is a disadvantage to women who seek to maintain social networks as part of their survival strategy within a low-income community. The reduction in the extent of these networks has also been shown in Western studies to have a direct link with an increase in morbidity (Davis 1992).

4.5. Employment in transport

Women are thought to constitute a small percentage of employees in the 'modern' transport sectors of most Third World economies. For example, the proportion of women in the actively engaged workforce of the transport and communication sectors of Nigeria and Ghana is 2 and 4% respectively. In South Africa, with its more advanced economy, 13% of the transport workforce are women. Even in Great Britain only 24% of employees in the transport sector are women, and almost one quarter of these are part-time workers. (Furthermore, if postal, telecommunications and other miscellaneous categories are excluded, the proportion of women in the GB transport sector falls to 17%.) It is also the case that women are represented disproportionately: only 2% of actively engaged women in South Africa and Ghana, and less than 0.5% in Nigeria, are employed in the transport sector.

There are no available data on the types of employment, but from observation it is fairly clear that few women are employed in the 'high-profile' transport jobs. For example, there are few examples of women being employed as drivers by the public transport sectors of developing cities; where they are employed, it is most likely in administration and secretarial work rather than on the operational side. There are notable exceptions: women conductresses and some minibuss drivers in the Caribbean, for example. Even in London, however, only 20% of bus conductors and 1% of drivers are female.

Women labourers are often used for road construction and maintenance in South Asia; they tend to work in gangs based on loose family or community groupings based in squatter settlements. Their work is very poorly paid, can be dangerous and can verge on slavery in some cases.

Women professionals in transport planning and management are scarce, except perhaps in some of the more highly educated developing countries like India and Sri Lanka. A problem for transport planners in general is that their profession receives scant recognition from the administrative cadres and politicians in the developing world.

In the informal human transport sector, women make an important contribution. As mentioned earlier, women in rural areas are often the main providers of transport for everything from basic necessities like water and fuelwood, to the harvested crop. Also, in urban areas they can often be found providing head-loading transport within market areas for carrying customers purchases and stallholders extra supplies.

4.6. Development policies

Macro-economic structural adjustment policies adopted by many developing countries at the behest of multilateral aid organizations have had some impact on the transport sector, which have had further 'knock-on' effects on the urban poor and women. City and rural bus services are often state-run in a highly state-regulated environment; structural adjustment policies have pursued both de-regulation (to

encourage more competition from the private sector) and, in some cases, privatization of state bus companies. The aims have been to encourage greater efficiency and the reduction of state subsidy to transport users.

Where this has led to excessive price rises, increased irregularity of service outside peak hours and a lack of investment in transport systems in general, it is the urban poor and women who have taken the brunt of the change. Equally these groups may have benefited where public transport services may have been improved, as a result of these policy changes; there is little evidence, as yet, to show which way the pendulum has swung, but inevitably, in targeting public transport for these changes, the impact has fallen disproportionately on women because they rely most on these services (Grieco 1991).

5. Conclusions

Current knowledge does not make it possible to answer, with certainty, all the questions set out in the introduction; there is a dearth of statistics and limited case-study work on which to draw. From the limited evidence, two of the questions can be answered quite convincingly: first, women do not have the same job opportunities in the transport sector as men; second, there are many examples which would suggest that transport tends to be less user-friendly to women and that there are more adverse impacts of transport development on women than men. What is less clearcut is the extent to which women's role or potential in society is restricted by the nature of transport.

The low participation of women in the transport sector is common even in the West, though perhaps accentuated in developing countries. It must, to a large extent, reflect a general society view about women in an employment sector which involves a large amount of manual and technical, as well as public-facing labour; and much of this during 'unsocial' hours or hours which certainly fit inconveniently with the other social roles of women. Indeed, many cultures (and religions) would actively discourage women's participation in these types of occupation. Our best guess is that few women are restricted from participation as a direct result of the nature of the transport system, i.e. by virtue of the fact that they are unable to access job opportunities in the transport sector.

The development of transport does seem to have a differential and adverse impact on women, compared to men. This is seen at the conceptualization and appraisal of development plans, through to the environmental, and quality aspects of travel. Many of these problems could be raised, if not resolved, through changes in planning practice: perhaps at the very least (and this is a tack being adopted by many aid organizations), any transport project appraisal should be accompanied by a statement of impact on women's interests, identifying the type of impact and the numbers affected.

Transport is generally 'unfriendly' to the majority of all users in the Third World, but there is no doubt that women (as well as the aged and infirm) experience particularly adverse travel conditions. There are unlikely to be short-term solutions to what in some cases are design deficiencies (of buses, for example), in others behavioural problems (of drivers and some male travellers) and in others the sheer problem of insufficient capacity to meet peak demand. Some cultures require segregation in the transport of the sexes, but whether this improves travel quality for women is not known.

The question of whether women's role or potential in society is restricted by the state of transport is not proven by available information, though there are strong grounds for believing that there is a link. What is clear is that most planning and development decisions are undertaken by men with little or no regard paid to women's needs. This

is an area where much more research is needed on how women make use of the transport system, and what opportunities are denied to them when the system cannot meet their needs. In establishing that a problem exists (i.e. poverty of access to job opportunities) it also has to be established very clearly the extent to which transport causes or contributes to the problem as opposed to other factors like land-use development, social and religious mores.

Only limited funds are available for transport development and it would seem inefficient to spend these solving socially divisive problems created by other causes; even where transport is found wanting, politicians may find it extremely difficult to take major investment decisions which favour women in such a politically sensitive and high-profile sector as transport. However, there may be other, less overt ways of promoting women's interests through, for example: the design standards of public transport vehicles; the promotion of higher driving standards; the encouragement of off-peak services geared to off-peak travel needs; the development of land-use in unison with transport capabilities and taking more account of women's travel needs.

Evidently there is a need for more basic data, and case study material which either focuses on the transport problems of women or at least makes note of any differential impacts of transport developments on women. Some of the basic data requirements could be captured through the routine nature of gathering national statistics; more gender specific data on income, population, employment (including part-time activities), education and other socio-economic indicators would help establish the framework of women's place in society. Of course, transport planners can have little influence over these developments, but they can ensure that any data base which they develop, or have control over, incorporates indicators of gender difference.

This review has outlined the roles which are common to women in societies throughout the world irrespective of class differences, ethnic origin and whether in the developing or developed world. These roles are as producers, reproducers and community managers. This has been used as the framework around which to explore whether the transport system has gender-bias, i.e. how and whether transport affects women performing their triple role in society in a differential and adverse way as compared to men. The chief factor running through the examination of the triple roles is time. The scarcity of time cannot be over-stressed and the ability of women to manage this successfully determines their fulfilling the triple role in society. Transport clearly has a part to play in this.

The relation of gender and transport has many aspects, of which this review has explored only the underlying premises. There is a need for a greater awareness throughout all aspects of transport—engineering and planning, urban and rural—of its development impact on the triple role of women in society. The inclusion of more gender-awareness into all fields of transport research can help to explore ways of correcting bias and provide a sounder basis for policy advice.

Acknowledgments

The work in this paper forms part of the research programme of the Overseas Centre (Programme Director: Dr J. Rolt) of the Transport Research Laboratory.

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Foreign summaries

Le transport est un élément essentiel dans la vie des femmes. Il détermine l'accès à tout un éventail de ressources et d'activités, tels que l'emploi, les soins de santé, l'enseignement et les besoins des enfants. L'article veut faire le point des connaissances à ce sujet et porter un jugement, en termes généraux, sur l'ampleur et les modalités de la contribution des transports au bien être féminin. Les auteurs procèdent d'abord à une analyse du rôle des femmes dans la société et de la façon dont les transports affectent l'exercice de ce rôle. La façon dont les femmes utilisent les transports et les déficiences des systèmes de transport à cet égard sont présentées de façon quantitative. Quant à savoir si le rôle des femmes dans la société et leurs possibilités sont effectivement pénalisés par le fonctionnement des transports, on manque d'information pour y répondre de façon sûre; mais beaucoup d'éléments plaident en ce sens. Ce qui est certain est que, dans une très large mesure, la planification et les décisions en matière de transport sont le fait des hommes, sans considération particulière, ou à peine, pour les besoins des femmes. Voilà donc bien un domaine où il est urgent de disposer de beaucoup plus d'information de base et d'études de cas sur les façons dont les femmes utilisent les systèmes de transport, sur les effets différentiels des systèmes de transport sur les femmes et sur les potentialités dont elles sont privées par les déficiences de ces systèmes. Un problème existe, notamment à cause des restrictions d'accès au marché du travail; il faut aussi montrer très clairement dans quelle mesure le transport y contribue, avec d'autres facteurs tels que les différenciations dans l'organisation de l'espace et les pratiques sociales et culturelles. Il faut en prendre une conscience plus aigüe dans tous les aspects des activités de transport: la programmation technique, la planification, tant urbaine que rurale, qui toutes ont une incidence pratique sur le rôle des femmes dans la société. Une telle prise de conscience, dans tous les domaines de la recherche en transport, devrait ouvrir des voies à une élimination de ces dysfonctionnement et à une amélioration des politiques de transports.

Verkehr stellt ein wesentliches Element im Leben von Frauen dar. Er beinhaltet den Zugang zu einer ganzen Reihe wesentlicher Ressourcen und Aktivitäten wie z.B. Beschäftigung, Gesundheitsfürsorge, Erziehung und Kinderpflege. Ziel dieses Artikel ist es, darzustellen, was bekannt ist, und allgemein die Frage zu klären, ob und wie der Verkehr einen stärkeren Beitrag zu den Interessen der Frauen leisten könnte. Der Artikel untersucht die Rolle der Frau in der Gesellschaft und arbeitet heraus, wie Verkehr diese Rolle beeinflusst. Quantitative Angaben zur Nutzung des Verkehrs durch Frauen werden gemacht; einige Defizite des Verkehrs—in dieser Beziehung—werden aufgedeckt. Die Frage, ob die Rolle der Frau oder ihr Potential in der Gesellschaft durch den Zustand des Verkehrssystems eingeengt wird, kann aufgrund der geringen verfügbaren Informationen nicht beantwortet werden, obwohl starke Anhaltspunkte dafür sprechen, daß es hier Abhängigkeiten gibt. Klar ist, daß die meisten Planungs- und Entwicklungsentscheidungen von Männern getroffen werden, wobei wenig oder gar nicht auf die Bedürfnisse der Frauen Rücksicht genommen wird. Hier werden umfangreicheres Basisdatenmaterial und Fallstudiendaten darüber benötigt, wie Frauen das Verkehrssystem nutzen, welche verschiedenen Verkehrseinflüsse auf Frauen wirken und welche Möglichkeiten ihnen vorenthalten werden, wenn das System auf ihre Bedürfnisse keine Rücksicht nimmt. Indem die Existenz eines Problems anerkannt wird (z.B. Zugangsschwierigkeiten zum Arbeitsmarkt), muß auch deutlich herausgearbeitet werden, bis zu welchem Maß der Verkehr dieses Problem verursacht oder einen Beitrag dazu leistet wie umgekehrt andere Faktoren, z.B. die Entwicklung der Flächennutzung oder soziale und kulturelle Gewohnheiten. Es gibt ein Bedürfnis nach einem größeren Problembewußtsein bei allen Aspekten des Verkehrs—Verkehrstechnik, Verkehrsplanung in Stadt und Land—und der Entwicklung seines Einflusses auf die dreifache Rolle der Frau in der Gesellschaft. Die Berücksichtigung eines umfassenderen geschlechtsbezogenen Bewußtseins in allen Bereichen der Verkehrsforschung kann dazu beitragen, Wege zu erkunden, Fehler zu korrigieren und eine solidere Basis für Politikberatung zu erstellen.

El transporte es un elemento esencial en la vida de las mujeres, ya que determina el acceso a un rango de recursos y actividades básicas tales como empleo, atención de salud, educación y cuidado infantil. El propósito de este trabajo es revisar qué se conoce y evaluar, en términos generales, si (y en ese caso cómo) el transporte puede contribuir más positivamente a los intereses femeninos. El trabajo examina los roles de la mujer en la sociedad e identifica las formas en que el transporte los afecta. Se presenta evidencia cuantitativa acerca de la forma en que las mujeres

utilizan el transporte, y se identifican algunos problemas en este sentido. Dada la escasa información disponible no se puede contestar la pregunta de si el estado del transporte restringe el rol o potencial de la mujer en la sociedad, aunque existen fuertes motivos para creer que existe una relación. Lo que está claro es que la mayoría de las decisiones de planificación y desarrollo son tomadas por hombres sin consideración de las necesidades femeninas. Esta es un área donde se requiere mayor cantidad de información de básica y material de estudio de casos acerca de cómo utilizan las mujeres el sistema de transporte, cuáles serían los impactos diferenciales de éste y qué oportunidades les son negadas cuando el sistema no puede satisfacer sus necesidades. Al establecer que existe un problema (por ejemplo, mal acceso a oportunidades de trabajo) también debe establecerse claramente hasta qué punto el transporte causa o contribuye a los problemas en relación a otros factores tales como desarrollo del uso de suelo o prácticas sociales y culturales. Existe la necesidad de lograr un mayor conocimiento de los impactos del transporte en el desarrollo del triple papel de la mujer en la sociedad en todos sus aspectos, ingeniería y planificación tanto a nivel urbano como rural. La inclusión de una conciencia sexual más completa en todos los campos de la investigación en transporte puede ayudar a explorar formas de corregir sesgos y proveer una base más sólida para la recomendación de políticas.

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Editorial suggestions for further reading

- GRIECO, M., PICKUP, L., and WHIPP, R. (editors), 1989, *Gender, Transport and Employment* (Aldershot: Avebury).

This book draws attention to the complex activity patterns of women in our society and to examine the role and significance of transport in their accomplishment. Key issues are identified in the introduction and these are taken up in the subsequent chapters. The first is the links between the female role in travel and cultural assumptions on family and community. The second is the view that travel is a gendered activity with divergent patterns for men and women. The third theme focuses on the particular needs which women have and which are based on their own complex patterns of activity. The final theme attempts to move away from prevailing stereotypes which construct women's coordinating behaviour as instinctual nurturing. Instead it focuses on the positive and creative management of time, tasks and travel by women. (DB)

- ROSENBLOOM, S., 1991, Travel patterns of elderly women alone, Texan University, Austin, Working Paper 8.

Currently more women over 65 live alone than live with spouses or relatives; both the number and the percentage are expected to grow. Regardless of income, all elderly women face growing mobility losses as they, or the other elderly drivers on whom they depend, inevitably lose driving skills. This paper focuses on the transportation problems of two types of older single women: those who are not licensed, with special emphasis on the 'stranded widow', and the aging female driver. Alternatives are suggested to the private car for the elderly woman in the future who faces declining driving skills or reduced ability to maintain a car; they range from those which keep the elderly in their cars as long as possible to those that allow them to augment or substitute for driving by using specially structured fixed route transit or lowered fare taxi services.

(Author)

- See also ROSENBLOOM, S., 1989, The transportation needs of single salaried mothers: a critical analysis, *Journal of Specialized Transportation Planning and Practice*, 3 (3), 295–310.