

TRAVEL CHOICES OF INFORMAL WORKERS IN KAMUKUNJI METALWORK CLUSTER, NAIROBI

S W GICHUNA and M N KINYANJUI*

University of Nairobi, P.O. Box, 30197, Nairobi, 00100, Tel: +254721122374; Email: susangichuna@yahoo.com.

*Institute for Development Studies, University of Nairobi, P.O. Box, 30197, Nairobi 0100

ABSTRACT

Travel is essential in people's day to day lives. Through travel, people are able to access places, other people, goods and services that are separated across space and time. Governments informed by the needs of the people invest funds in infrastructural development to facilitate efficiency in travel. This study focused on the travel needs and modal choices of informal workers in Kamukunji metalwork cluster in Nairobi. Data was collected from a sample of 63 respondents through a field survey, travel diary and key informant interviews. The study found that informal workers in Kamukunji had unique travel patterns motivated by needs for social integration, commuting to work, sourcing raw materials and supply of end products to customers. The travel modes used to meet these needs were found to be specific to the travel purpose. Descriptive statistics, thematic analysis and Chi-Square tests were used in data analysis. The study concludes that the travel patterns and choices of informal workers in Kamukunji and the informal sector at large impact on travel and transport use in Nairobi. This is important for the stakeholders involved in planning and infrastructure development.

Key words: Travel, informal workers, modal choice, motives, infrastructure

1. INTRODUCTION

Travel is an important aspect of people's lives. It enables access to other people, facilities and places. Sheller and Urry (2006) observe that the world today is experiencing vast physical movements despite the introduction of technologies such as mobile phones and the internet which could substitute physical movement. In a bid to meet the numerous needs of travel especially in the urban settings, most governments in the developed and developing countries are constantly restructuring their cities to facilitate movement in the cities. Understanding the motivations behind travel and the travel choices of a people is therefore essential.

Travel is essential in informal work. For instance, informal workers engaged in activities such as manufacturing constantly travel in search of raw materials and to supply their goods and services. Informal activities are widespread in cities of most developing countries. For instance, the Economic Survey, 2010 indicates that 5.1 million people in Kenya were employed in the informal sector in the year 2002 (GOK, 2010). This number has been growing over the years. Indeed, the scale of these informal activities impacts significantly on the travel patterns and transport use in the urban areas. However, the travel needs and modal choices of informal workers in Kenya and in many other countries remain scarcely investigated and documented (Behrens, 2001). A lot of literature exists on the various issues affecting the informal workers, for instance, the challenges of credit access, working conditions, business productivity and growth, skills and technology acquisition, as well as market access (Akoten, 2007) but little has been documented on

their travel patterns or transport use. This study argues that informal workers have unique travel patterns and choices which remain largely unknown and therefore marginalized in transport planning and city restructuring efforts. The study therefore seeks to contribute to knowledge on the travel choices of informal workers.

This study hence focuses on the travel choices of informal workers in Nairobi in terms of their travel needs, the travel modes used to meet these needs and the factors influencing these modal choices. Data was collected from informal workers at Kamukunji metalwork cluster in Nairobi. The informal workers at Kamukunji who are commonly referred to as *jua kali* (Swahili word meaning hot sun) workers, are organized into micro and small enterprises dealing in fabrication and sale of metal products such as boxes, buckets, gates, stoves, grills, cooking pots and pans. A field survey, key informant interviews and travel diary survey were applied in collecting data from a sample of 63 respondents. Systematic random sampling technique was used to select 60 respondents for the field survey while the 3 respondents for the key informant interviews were sampled purposively. The travel diary was deemed useful in analysing and detailing the travel patterns of the informal workers. For the travel diary, a sub-sample of 10 respondents was selected from the field survey respondents using simple random sampling method. The study applied the activity-based travel diary which was used primarily to collect information on the activities the respondents engaged in over a period of one week, the mode of transport used to access these activities, the reasons for choosing these modes as well as the time, distance and cost incurred for each trip. The main aim of using the diary was to provide in-depth information on the purposes of travel by the *jua kali* workers, the modes of transport used, and the reasons for choice of travel mode. The diaries were completed by the interviewer together with the respondents through recall interviews. This was because pre-test of the diary revealed that the respondents were reluctant to complete the diaries on their own. Descriptive statistics, thematic analysis and Chi-Square tests were used in analysing the data.

2. STUDY FINDINGS AND DISCUSSION

2.1 Travel needs of *jua kali* workers

The key informants reported that informal workers at Kamukunji had a variety of travel needs which included commuting to work, sourcing raw materials and delivering goods to customers. The field survey and the travel diary also revealed a variety of discretionary travel needs including attending social groupings (commonly known as *chama*), shopping and recreational activities. The study found that most of the respondents (51.7%) resided between 4.1 to 11 kilometres from Kamukunji. About a quarter (21.7%) of the respondents resided 4 kilometres or less from Kamukunji while 21.6% resided between 11.1 to 24 kilometres. Interestingly, about 5% resided 25 kilometres away. The findings were unexpected since informal workers are depicted in other studies as people who mainly reside close to their place of work. For instance, Mitullah and Njeri (2003) studied informal construction workers in Nairobi and found that majority of them resided between 0.1 to 3 kilometres from the construction sites. Lack of decent and affordable housing near the cluster could be the reason why most of the *jua kali* workers resided far from Kamukunji. About a third (33.3%) of the *jua kali* workers resided in Dandora and Kayole (approximately 10 kilometres) which are some of the areas defined as low income in Nairobi. Availability of low cost housing in these areas could further explain why *jua kali* workers resided far from Kamukunji.

Jua kali workers engage in travel as they supply their finished products to customers. At least all the respondents had customers who always bought the products from their business premises at Kamukunji. About 36.8% of the respondents however, reported that they had customers who did not buy goods from Kamukunji instead, they made telephone transactions and had their goods either sent to them or delivered by the *jua kali* workers. Most of the respondents (67.4%) sent goods to their customers instead of delivering them in person (32.6%). This is possibly due to the costs involved in terms of money and time spent away from the work premises. Those who sent the goods travelled an average distance of 1.4 kilometres to deliver the goods to the parcel delivery agents, mainly bus parcel services. In contrast, respondents who delivered goods in person travelled an average of 77.7 kilometres since most of the customer locations were in far upcountry areas. Considering the distance travelled, personal deliveries by 32.6% of the *jua kali* workers was an interesting finding. Perhaps deliveries in person had special benefits for the business over sending, for instance, the opportunity to market the goods and establish more customers.

Sourcing raw materials is a major activity for the *jua kali* workers since fabrication of metal products is the main activity at the cluster. About (42.1%) of the raw materials were sourced within Kamukunji while 57.9% were sourced from areas nearby or away from Kamukunji. The average distance covered while sourcing raw materials was about 10 kilometres although most of the raw materials were sourced within the cluster. The respondents attributed this to the fact that sourcing raw materials was not a straight forward journey. It involved moving from one point to another since not all raw materials could be found at a single location. The travel diary revealed other trips made by the *jua kali* workers which had not been brought out by the field survey. The diaries showed that *jua kali* workers conducted multiple trips during the day while doing activities such as taking raw materials to the fabricators and taking the finished products to the cleaners and painters. These trips were mainly made within the cluster.

Apart from work-related travel needs, *jua kali* workers reported multiple activities that led to discretionary travel. These activities include informal meetings and associations (*chama*, religious activities, and seminars), formal meetings (school meetings, *Jua Kali* Association meetings), financial obligations (settling bills, banking), shopping, recreation and obligations to friends and relatives (spending quality time, burial, family gatherings). Discretionary travel was mainly generated by informal meetings and associations (41.7%) as shown in Figure 1. This implies that social integration achieved through activities such as social groupings were important for the *jua kali* workers. Kinyanjui (2012) similarly found that the *chama* was an important avenue for human interaction and organizing informal markets.

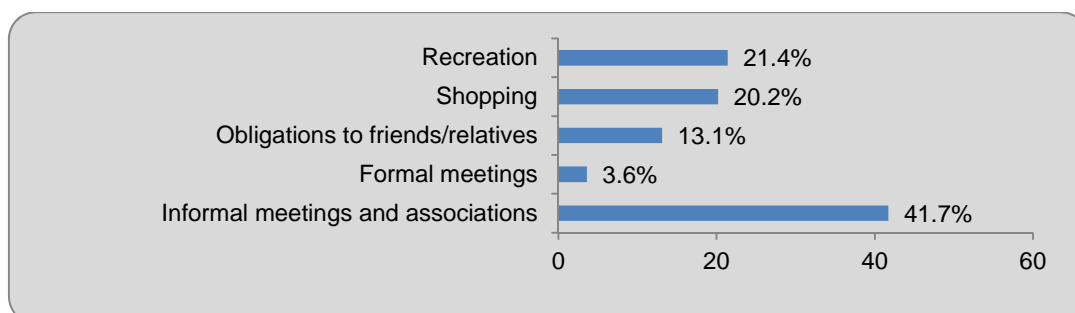


Figure 1: Discretionary travel needs of *jua kali* workers

The study examined the trip generation rates of the *jua kali* workers. Survey respondents were asked to state the number of trips they generally made in a day. The results showed that *jua kali* workers generally made about 2.7 trips in a day. Majority of the respondents in the survey (73.3%) made 2 trips in a day. These were mainly trips to and from work. About 23.3% of the respondents made 4 trips in a day while 3.4% made 6 or more trips in a day. Trips exceeding 2 constituted trips to the raw material sources, delivery of finished products and social purposes. Results of the travel diary however suggest that the number of trips made by the *jua kali* workers was higher than reported in the field survey. The diaries interestingly revealed that the respondents made an average of 3.3 trips in a day. This points to the fact that people tend to underestimate the number of trips they make.

2.2 Travel mode choices of *jua kali* workers

The results of the study show that the travel mode choice of *jua kali* workers varied according to purpose of travel. The findings are illustrated in Table 1.

Table 1: Percentage mode use by trip purpose

	Work trips	Travel to raw material sources	Transport of raw materials	Supply of finished products	Discretionary Purposes
<i>Matatu</i>	54.5	17.9	3.0	4.9	40.2
Personal Vehicle	4.5	2.6	1.0	2.5	4.6
Bus	19.7	2.6	1.0	8.6	11.2
Walking	13.6	59	1.0	2.5	43
Hired vehicle	0.0	5.1	20.8	17.3	0.0
Motorcycle	4.5	7.7	4.0	1.2	0.0
<i>Mkokoteni</i>	0.0	0.0	39.6	45.7	0.0
Head/shoulder loading	0.0	0.0	12.9	1.2	0.0
Hired head loaders	0.0	0.0	6.9	1.2	0.0
Trolley	0.0	0.0	6.9	3.7	0.0
Bicycle	0.0	0.0	1.0	1.2	0.0
Train	3.0	0.0	0.0	0.0	0.0

The table shows that Motorized transport is predominant in work trips. Non-motorized transport as well as use of intermediate modes of transport is dominant in sourcing of raw material stocks, supply of finished products and in discretionary trip purposes.

Of interest was the travel modes used in transport of raw materials and in supply of finished goods. In these categories, the travel modes used are spread out across nearly all modes (Motorized and non-motorized and intermediate means of transport-NMIMT). In this way, transport of goods differs from work and discretionary trips (see Figure 2).

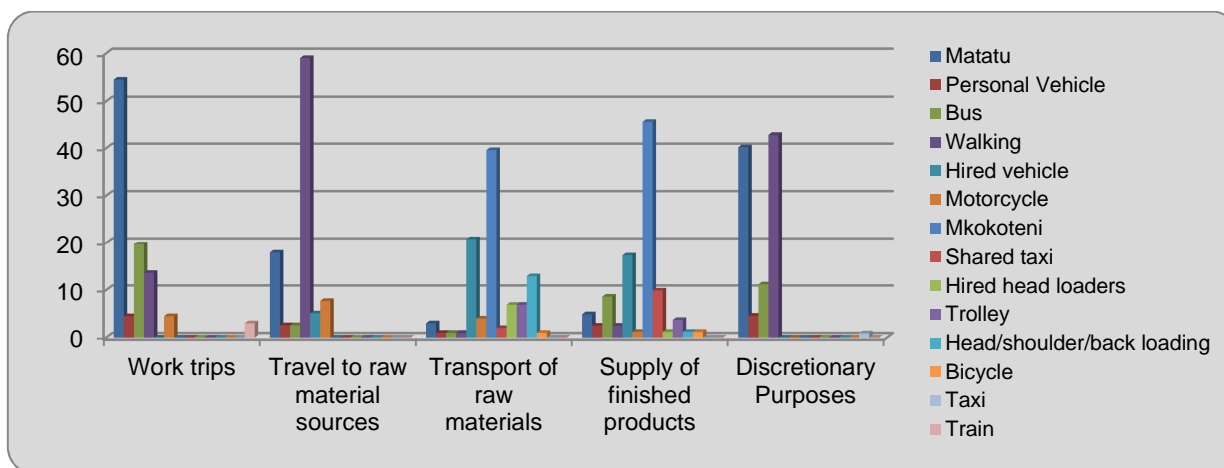


Figure 2: Percentage travel mode use by purpose

Motorized transport was dominant in work trips because most of the respondents travelled long distances from their residential area to work (approximately 10 kilometres on average). Respondents who resided more than 4.1 kilometres from Kamukunji used motorized modes such as *matatu* (a popular paratransit mode in Kenya), bus, train and personal vehicle. Those who resided within 4 kilometres from Kamukunji mainly walked for their work trips. However, some of the respondents indicated that they used multiple modes. *Matatu* was the predominant mode in work trips with more than half (54.5%) of the respondents using it. This was unexpected since *matatus* have largely been depicted as expensive and unaffordable to many segments of the population in Nairobi (Ommeh, 2010). *Matatus* are the most frequent paratransit modes on most routes in Nairobi (Graeff, 2009) which could be the reason of their predominance in the mode choice of *jua kali* workers for work trips. Contrary to what other scholars found, there was no bicycle use by the *jua kali* workers in Kamukunji. Mitullah and Makajuma (2011) found that bicycles along Jogoo Road corridor in Nairobi were mainly used by people working in the informal sector. A possible explanation could be that majority of the *jua kali* workers resided far from the work place which therefore did not favour the use of a bicycle. It could also be due to lack of supportive infrastructure for cycling. For instance, 78.3% of the respondents reported that there were no cycling lanes on their routes.

More than half of the respondents (59%) walked to the raw material sources. *Mkokoteni* (handcart) was the main mode of transport for raw materials (39.6%) and in delivery of goods to the customers (45.7%). The use of *mkokoteni* (handcart) predominates in both cases mainly due to low costs, convenience and distance as revealed by the travel diary. It was surprising to find the use of head loaders (know as *beba beba* in Swahili) in the transport of raw materials. The raw materials used by the *jua kali* workers in Kamukunji comprised metal sheets, metal bars and tubes and various scrap materials, some of which are bulky and hazardous in nature. From observation, some of loads appeared bulky and also unsafe for human portage. For instance, some of the *beba beba* were observed carrying pieces of metal sheets with sharp edges wrapped with a thin metal strand. This points to the fact that transport modes appropriate for transporting such loads were unaffordable to some of the *jua kali* workers. Travel for discretionary purposes was mainly met by walking and *matatu*.

Analysis of the travel diary suggests that the share of walking was actually higher than what these results show. This is because even where motorized transport was used, walking was added as the access mode (to get to the main mode) and the egress mode (used after the main mode). Some of the non-motorized and intermediate modes used by the *jua kali* workers involved walking, for instance, *beba beba*, trolley and *mkokoteni*. The travel diary also revealed multiple trips made by walking within the cluster while doing activities such as taking raw materials to the fabricators, collecting the finished goods from the fabricators and taking the finished products to the cleaners and painters.

The *jua kali* workers reported that there were various challenges faced in travel. The study shows that walking was an important mode of travel for the *jua kali* workers. About 15% of the respondents however reported that pedestrian walkways were not available on the routes they used while 85% indicated that they were available. Among those who reported availability of pedestrian walkways, 39.2% described the walkways as partly paved and 21% as unpaved. This made them muddy during the rainy seasons. About 9.8% said they were unprotected and hence prone to invasion by motorized modes, *mikokoteni* and cyclists. Another 9.8% described them as inadequate forcing the pedestrians to share the roads with motorized modes.

Although the use of *mkokoteni* by the *jua kali* workers is widespread, the respondents reported that there was no dedicated infrastructure for their use. A key informant reported that *mikokoteni* are viewed as a nuisance and a cause of traffic congestion because they share the roads with the motorized modes. They are hence barred in parts of the central business district of Nairobi. According to the *jua kali* workers, they take risks most of the times because they still need to deliver goods to their customers. For instance, sometimes their goods are confiscated by the city council police if the *mkokoteni* is found in some parts of the central business district. Traffic congestion and fare hikes during peak hours were reported as major challenges in work trips. Traffic congestion was reportedly a big disservice for most *jua kali* workers such as fabricators who left work very tired. *Jua kali* workers spent an average of 2 hours and Ksh. 122 on work trips per day. As a coping strategy, about 28.3% of the respondents started their journey to work between 4a.m and 5.30a.m in order to avoid traffic congestion and fare hikes experienced on most routes in Nairobi after 7a.m.

2.3 Factors influencing travel choices of *jua kali* workers

Reilly and Landis (2002) argue that socio-demographic factors of individuals such as age, gender and level of education may directly influence the travel choices of individuals. The authors highlight that these factors have a potential of revealing the influence of unobservable factors (such as preferences, tastes and attitudes) on travel choices. The relationship between these factors and the travel mode choice of *jua kali* workers was therefore examined.

The study sought to investigate the influence of gender on the travel mode choice of *jua kali* workers. The ratio of males and females in the study sample was therefore 1:1. Table 2 shows the results.

Table 2: Travel mode choice for work trips by gender

Gender of respondents		Mode of travel						Total
		Matatu	Bus	Walking	Personal vehicle	Motorcycle	Train	
Male	Count	16	5	5	1	2	1	30
	% within Gender	53.3%	16.7%	16.7%	3.3%	6.7%	3.3%	100.0%
Female	Count	18	6	2	2	1	1	30
	% within Gender	60.0%	20.0%	6.7%	6.7%	3.3%	3.3%	100.0%
Total	Count	34	11	7	3	3	2	60
	% within Gender	56.7%	18.3%	11.7%	5%	5%	3.3%	100.0%

(Chi-Square= 1.88, df= 3, p= 0.598)

More males than females used a motorcycle for work trips. Perhaps the exposure of motorcycles to motorized modes made females perceive it as an insecure mode. The table also indicates that fewer females than males walked to work. This may be due to perceived insecurity in the early morning and late evening hours. Although more females than males used a personal vehicle, the study interestingly found that the women were car passengers and not car drivers. This sustains the traditionally held view that men take preference in entitlement to limited household property. However, Chi-Square test suggests that there is no significant relationship between gender and the travel mode choice of *jua kali* workers (Chi-Sq. =1.88, df= 3, p> 0.05).

The relationship between age and the travel mode choice of *jua kali* workers was investigated and the results are presented in Table 3.

Table 3: Travel mode choice for work trips by age

Age of respondents (yrs)		Mode of travel for work trips				Total
		Matatu	Bus	Walking	Other	
20.0 - 40.0	Count	25	11	6	5	47
	% within Age	54.3%	23.9%	13.0%	10.6%	100.0%
41.0+	Count	9	1	1	2	13
	% within Age	69.2%	7.7%	7.7%	15.4%	100.0%
Total	Count	34	12	7	7	60
	% within Age	56.7%	20.0%	11.7%	11.7%	100.0%

(Chi-Sq. =3.249, df=3, p= 0.355).

The Table shows that most of the respondents aged 21 years and above used a *matatu* for their work trips. Trips to work by walking among the older respondents (41 years and above) were few which suggests that the preference for walking decreased with age. The preference for other modes such as motorcycle also decreased with age. Chi-Square test however shows that there is no significant relationship between age and travel mode choice of *jua kali* workers (Chi-Sq. =3.249, df=3, p>0.05).

The influence of area of residence on travel mode choice of *jua kali* workers was examined in terms of distance from residential area to work. The study found that respondents who resided within 4 kilometers from Kamukunji mainly walked for their work trips. On the other hand, respondents who lived more than 4 kilometers from Kamukunji mainly used motorized modes including *matatu*, bus, train and personal vehicle. None of these respondents walked for their work trips. See Figure 3. These findings suggest that distance influences the travel mode choice of *jua kali* workers. Chi-Square test also shows a significant relationship between distance and the travel mode choice of *jua kali* workers (Chi-Sq. =40.206, df =15, p<0.0005).

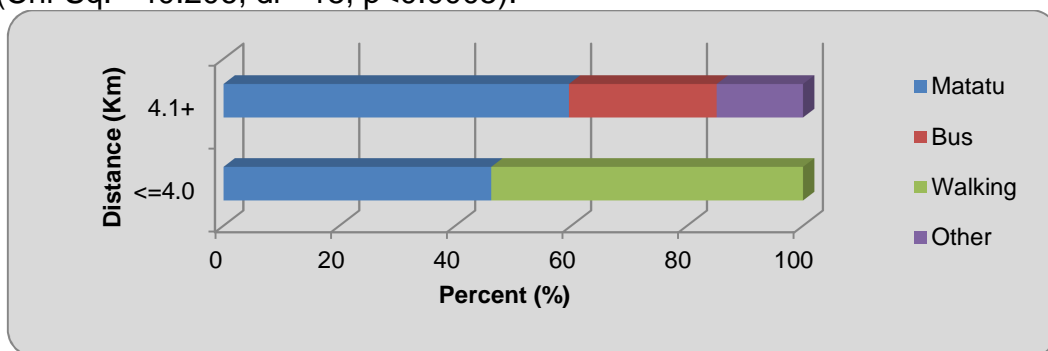


Figure 3: Distance (km) by mode of travel

Education level is usually associated with income and status such that the more education, the more a person is likely to have a well-paying job hence more income (Davidov, 2007). Table 4 illustrates the travel mode choice of *jua kali* workers with regard to education level.

Table 4: Travel mode choice for work trips by level of education

Level of education		Mode of travel to work				Total
		Matatu	Bus	Walking	Other	
Primary	Count	13	4	3	4	24
	% within Level of education	54.2%	16.7%	12.5%	16.7%	100.0%
Secondary and above	Count	21	8	4	3	36
	% within Level of education	58.3%	22.2%	11.1%	8.3%	100.0%
Total	Count	34	12	7	7	60
	% within Level of education	56.7%	20.0%	11.7%	11.7%	100.0%

(Chi-Sq. =1.147, df =3, p= 0.766)

Majority of the respondents in both levels of education used a *matatu* for their work trips. The results suggest that education level does not influence the travel mode choice of *jua kali* workers. Chi-Square test also revealed that there was no significant relationship between education level and the travel mode choice of *jua kali* workers in Kamukunji (Chi-Sq. =1.147, df =3, p>0.05). This is probably because the *jua kali* workers were subjected to similar work opportunities at the cluster regardless of their level of education.

3. CONCLUSION AND RECOMMENDATIONS

Jua kali workers travel to access their work places, raw material sources and their customers. In addition, they pursue travel to access activities that offer social integration, for instance, *chama* and other recreational activities. The travel modes used by the *jua kali* workers vary according to the travel need in question. Transport modelling in Kenya and in most other countries is mainly based on work travel analysis. This implies that these models fail to factor in other important travel needs such as the needs to source raw material stocks. To achieve a holistic transport model, city planning and transport development need to consider travel needs beyond work trips.

The travel patterns of *jua kali* workers are unique because in addition to the work trips, most of them make extra trips in a day either to the raw material sources, to their customers or when accessing social activities. This implies that the informal workers contribute significantly to the bulk of trips made in Nairobi. Efforts should therefore be made to factor in the travel needs of the informal workers in any plans towards transport development and city restructuring. Distance was the only factor found to influence the travel mode choice of *jua kali* workers. Most *jua kali* workers travel long distances for their work trips implying that land use patterns in Nairobi have led to greater segregation of work places from residential areas. Provision of affordable housing near the work locations and redistribution of *jua kali* clusters could be a strategy for minimizing the long distances travelled and consequently motorized transport use.

Jua kali workers use non-motorized and intermediate transport for most of their travel needs. Motorized transport was mainly used in the work trips or while transporting finished goods to far locations. As the Kenyan government like in many other countries restructure the city to suit the needs of motorized transport, most of the travel needs of *jua kali* workers met through non-motorized and intermediate transport modes will remain largely marginalized. For instance *mkokoteni*, is widely used by the *jua kali* workers yet there is no supportive infrastructure for its use. Walking constitutes a major mode of travel for the *jua kali* workers but the Kamukunji area lacks proper pedestrian walkways which are paved and protected. This calls for policies that cater for the development and improvement of infrastructure that supports non-motorized and intermediate transport modes. Dedicated lanes for cycling, *mkokoteni* use and properly paved and protected pedestrian walkways are essential for informal workers to meet their travel needs efficiently.

With regard to the study methodology, the travel diary was found to be a valuable tool in travel analysis. The travel diary was able to bring out the complexity of travel patterns and choices which was not possible in the survey. However, the self-completed diaries were found to be unsuitable since most of the respondents perceived completing the diary as a complex and tedious exercise. This study therefore finds the interviewer-completed diary most reliable.

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