

'BODA BODA' BICYCLE TAXIS AND THEIR ROLE IN URBAN TRANSPORT SYSTEMS: Case studies of Kisumu and Nakuru, Kenya

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ABSTRACT

This paper reports upon an investigation into the role played by *boda boda* in urban transport systems in Kisumu and Nakuru (Kenya). A *boda boda* is a bicycle taxi which provides 'for hire' type transport services for passengers and goods. The research examined the operating characteristics of, and challenges facing, bicycle taxi services, and explored the measures that might be formulated by the concerned authorities to manage and support them. The study involved a (n=500) survey of bicycle taxi operators, as well as interviews with local authority officials. The study found that bicycle taxis serve an identifiable niche market, in the form of short service trips largely for the purposes of accessing work activities (directly, or as a feeder within a multi-mode trip), and off-road trips in high density unplanned settlements where higher capacity vehicles cannot pass. Their ability to pass slow-moving or stopped motor vehicles, enable them to operate efficiently and competitively in congested networks. It is argued that bicycle taxis have a place in Kenyan urban transport systems, and their absence would leave service gaps. Recent increase in motorcycle *boda boda* operations, at the expense of bicycle *boda boda* market share, is a cause for concern, and it is recommended that the concerned authorities adopt a policy position in this regard. It is argued that bicycle *boda boda* operations should be facilitated and supported by the relevant public authorities. The paper concludes with recommendations on measures that authorities might adopt to better regulate and support bicycle taxis. These relate to bicycle lane construction, the promulgation of enforcement by-laws, third party insurance cover, operator association membership, and the need for a harmonised national non-motorised transport policy.

1 INTRODUCTION

A *boda boda* is a bicycle taxi with a padded cushion fitted onto a reinforced rear seat, capable of transporting both passengers and goods (see figures 1-2). *Boda boda* started their operations in Kenya in the 1960s in the town of Busia (located on the Ugandan border). From there they spread to other rural and urban areas in both countries, with a faster rate of diffusion occurring in Uganda. Initially they were used to smuggle goods across the Kenyan-Ugandan border (from whence the name, *boda boda*, was derived), but in time they transformed into an informal 'for hire' type of transport service catering largely to passenger needs. Past published studies of *boda boda* operations have focussed on Uganda (Malmberg-Calvo 1994, Howe and Davies 2002, Howe 2003, Heyen-Perschon 2004, Howe and Maunder 2004). While Kenyan *boda boda* operations have been the focus of a number of student dissertations between 1990 and 2001 (Khayesi

2010, McCormick 2010), relatively little has been published, and little detailed information on the nature of operations is available.



Figure 1. A *boda boda* operator carrying a passenger load (Border Post, Busia)



Figure 2. A *boda boda* operator carrying a goods load (Industrial Zone, Nakuru)

Over the past two decades, motorcycle taxis have emerged in East Africa as a motorised variant, and at the expense, of bicycle *boda boda*. As in the case of bicycle *boda boda* innovation and diffusion, motorcycle *boda boda* emerged earlier and spread faster in Uganda – following the deregulation of motorcycle imports in 1994 (Kamuhanda and Schmidt 2009, Kisaalita and Sentongo-Kibalama 2007). Motorcycle taxis in West Africa emerged a decade earlier, in response to a poorly served passenger market and relatively unrestricted market entry, and have grown into a dominant travel mode – known locally as *ganzemidjan* in Benin, *bendskin* in Cameroon, *kabu kabu* in Niger, *okada* in Nigeria, and *oleyia* in Togo (Diaz Olvera *et al* 2010, Mahlstein 2009). Many medium-sized Nigerian cities, for instance, rely solely on *okada* for intra-city transport services (Cervero 2000). In comparison, Kenyan motorcycle taxis have emerged very recently – stimulated by the introduction of a zero-rated import duty on motorcycles below 250cc in the 2006 national budget – but, despite spreading fast, would appear from anecdotal reports to be less numerous than bicycle *boda boda* at this point in time.

This paper reports upon an investigation into the role played by bicycle *boda boda* in urban transport systems in Kenya (Mutiso 2010). The research aimed, firstly, to understand the operating characteristics of, and challenges facing, *boda boda* services, and secondly, to explore the measures that might be formulated by the concerned authorities to manage and support them. With regard to the latter aim, given the growth in motorcycle taxis at the expense of bicycle taxis elsewhere in the region, the research sought to make a recommendation on whether authorities should embrace or resist this trend.

The study focussed on two case study towns north-west of Nairobi – Kisumu and Nakuru (see figure 3) – both of which have a high number of bicycle *boda boda* operators relative to other Kenyan cities and towns. It is estimated that the *boda boda* share of weekday modal splits in these two towns is in the region of 16-20% (Makajuma 2006, Keter 2009). Given current estimates of the number of operators in each town (Cox 2010, Omondi 2007, Mazuri 2010), and the operator trip rates found in this study, it is further estimated that approximately 160,000 and 90,000 service trips are made per day in Kisumu and Nakuru respectively. Both towns are provincial capitals (Nyanza Province in the case of Kisumu, and Rift Valley Province in the case of Nakuru), and both support current populations estimated to be in the region of 500,000. Perhaps due to its closer proximity to Busia and the Ugandan border, *boda boda* have been operating for slightly longer in

Kisumu than in Nakuru. According to the Kisumu City Council (2005) *boda boda* have been operating there since 1997, while Omondi (2007) states *boda boda* have been operating in Nakuru since 2003. The principal difference between the two case studies, and potentially the focus of useful comparison with respect to service quality, is the better organisation of *boda boda* operators in Nakuru, than is the case in Kisumu.

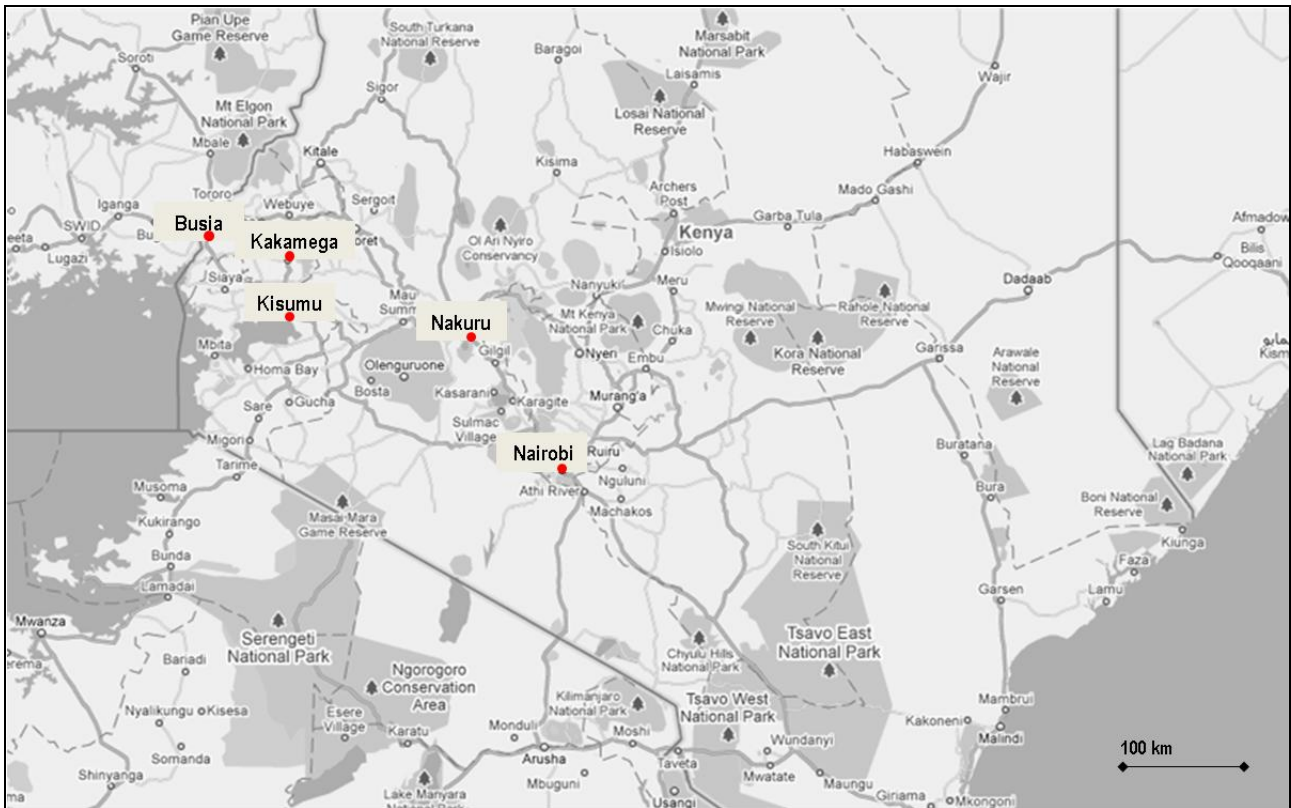


Figure 3. Locality map (<http://maps.google.co.za>)

The paper is divided into four sections. The following section describes the method that was applied in the research. Section three presents the findings of the research, specifically with respect to: operating characteristics; socio-economic impacts; the extent of existing regulatory and support measures; and operator attitudes. Section four concludes with recommendations on measures that the relevant authorities might adopt to better regulate and support *boda boda*.

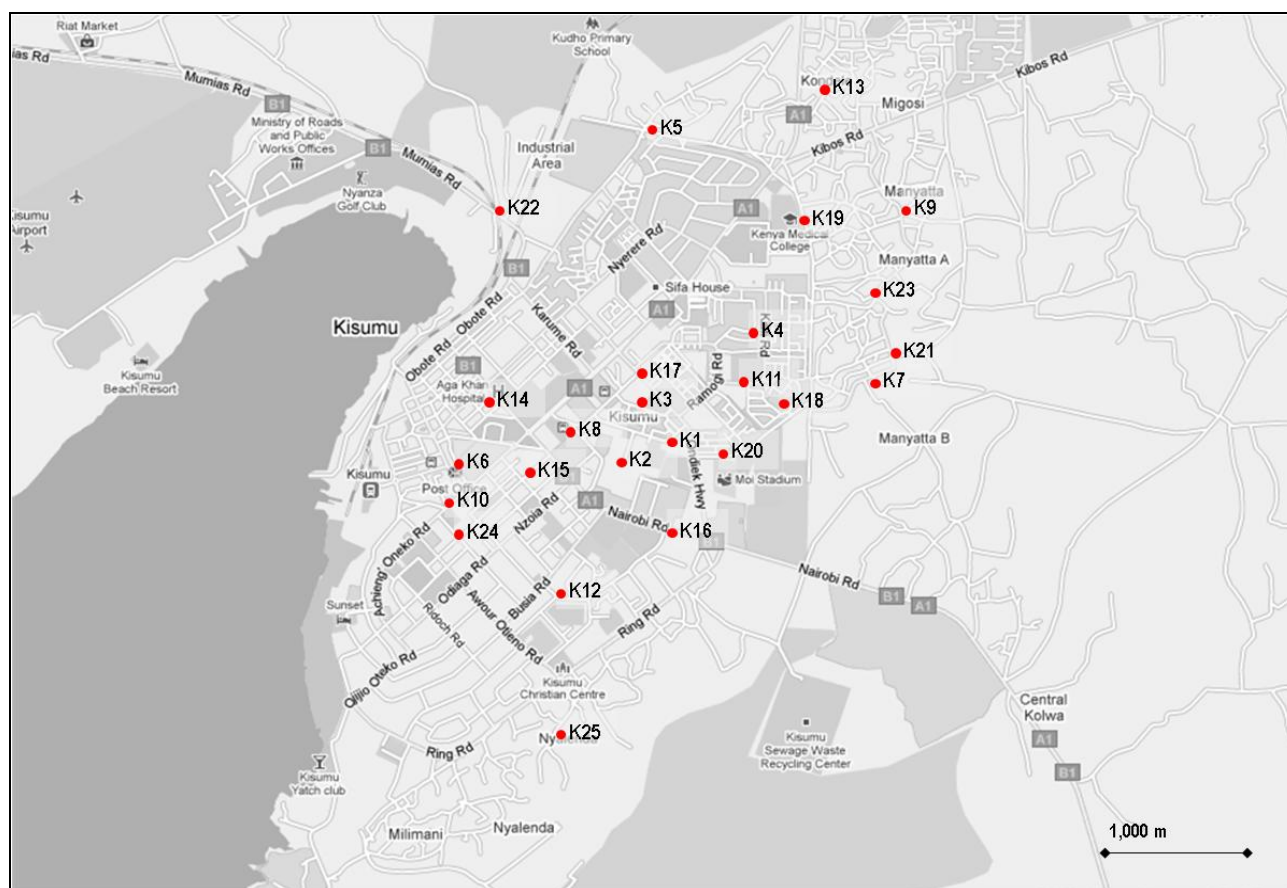
2 METHOD

The study involved a (n=500) survey of *boda boda* operators, as well as qualitative interviews with local authority officials in Kisumu and Nakuru. The quantitative operator survey questionnaire took two forms: one for operators who owned the bicycles they were using; and the other for operators who hired their bicycles. Both questionnaires included questions relating to operator demographics, operating characteristics, passengers served, operator attitudes towards other modes and authorities, institutional arrangements, and prevailing regulations.

A (n=42) pilot survey was carried out in June-July 2009 in five of the seven Kenyan provinces (Central, Coast, Rift Valley, Western and Nyanza) in randomly selected rural and urban areas. Following adjustments to the questionnaires and the sample design, the main survey was administered, by three trained interviewers, between November 2009

and February 2010. Operator interviews lasted between 40 and 60 minutes, and were conducted in Kiswahili.

Within each town, 25 *boda boda* ‘stages’ were randomly selected for on-site interviews with randomly selected operators. A ‘stage’ is an informal ranking facility, typically adopting its name from a nearby landmark (see figures 5-6) – the locations of the ‘stages’ surveyed are illustrated in figures 4 and 7. Ten operators were interviewed at each stage, resulting in a sample of 250 operators in each town. Based on the estimated number of *boda boda* operators in Kisumu (10,000, Mazuri 2010) and Nakuru (6,000, Cox 2010, Omondi 2007) this sample is estimated to represent 2.5% of operators in Kisumu and 4.2% of operators in Nakuru. At a 95% confidence level, these sample sizes result in an estimated margin of error of 6.12% and 6.07% in Kisumu and Nakuru respectively. Across all ‘stages’, 20% of randomly selected operators declined to be interviewed and were therefore substituted. The sampling bias this introduced is likely to have taken the form of the omission of some of the busier operators. Following data collection, data were coded and captured into a flat-line database comprised of 116 data fields.



Notes:

K1	Kboys	K6	KCB	K11	Ouko	K16	Sai	K21	Makasembo
K2	Social	K7	Mtejula	K12	Abunga	K17	Swan	K22	Kicomi
K3	KCC	K8	Fanana	K13	Kondele	K18	Harina	K23	Kibuye
K4	Tuskys	K9	Manyata	K14	Aga Khan	K19	Rassia	K24	Kilimani
K5	Jua Kali	K10	Nakumatt	K15	Crescent	K20	Ondiek	K25	Nyaori

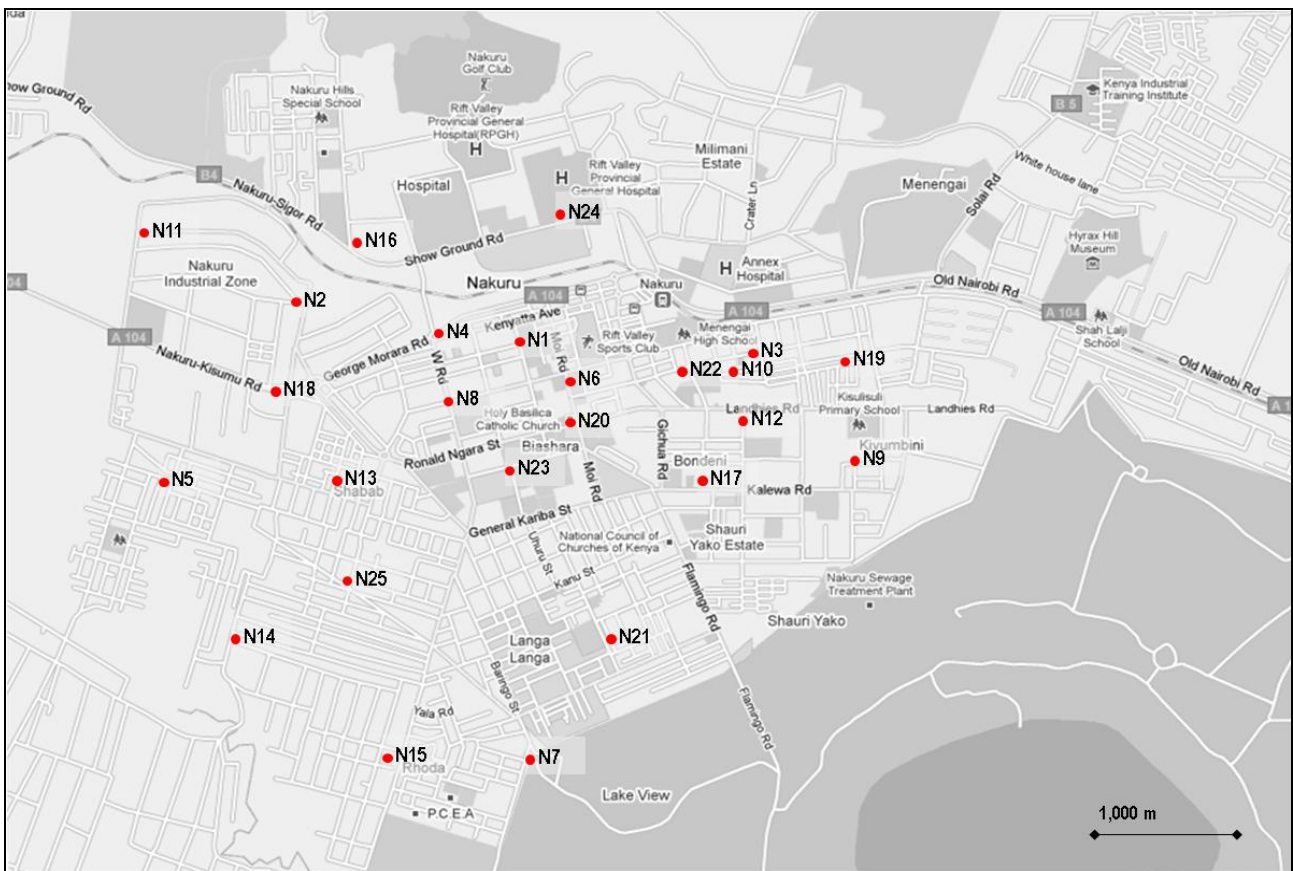
Figure 4. Surveyed *boda boda* ‘stages’ in Kisumu (<http://maps.google.co.za>)



Figure 5. A *boda boda* operator 'stage' in Kisumu (Fanana [K8])



Figure 6. A *boda boda* operator 'stage' in Nakuru (Head Office [N10])



Notes:

N1	Securicor	N6	CID	N11	Waterbuck	N16	Show Ground	N21	Zakayos
N2	KFA	N7	Summit	N12	Evans	N17	Bondana	N22	Taidys
N3	Menengai	N8	Gilanis	N13	Weavers	N18	Akamba	N23	Kolen
N4	Total	N9	Kivumbini	N14	Laken	N19	Maindi Choma	N24	Medical
N5	Check Point	N10	Head Office	N15	Topten	N20	Holy Cross	N25	Gulf

Figure 7. Surveyed *boda boda* 'stages' in Nakuru (<http://maps.google.co.za>)

3 FINDINGS

The findings of the study are discussed in terms of *boda boda* operating characteristics, socio-economic impacts, the extent of existing regulatory and support measures, and operator attitudes.

3.1 Operating characteristics

The study found that *boda boda* bicycle taxis provide ‘for hire’ area-wide transport services, operating out of ‘stages’ which are fairly evenly geographically distributed. In both towns operators indicated that the majority of their service trips are to carry passengers to or from work activity destinations (65% and 67% of service trips in Kisumu and Nakuru respectively). Typically only one passenger is carried, but occasionally two passengers are transported. Operators sometimes wait for their passengers to conclude their activities in order to provide a return trip service. They operate without insurance cover for either themselves or their passengers (Keter 2009, Mazuri 2010). In both towns *boda boda* either provide services on routes inaccessible to vehicular modes (36% and 38% of service trips were reported to be on unpaved off-road paths in Kisumu and Nakuru respectively), provide feeder services to higher capacity modes (i.e. intercity buses and trains), or directly compete with others modes (i.e. motorcycle *boda boda*, *tuk tuks*, and *matatus*) for passengers.

The number of *boda boda* service trips provided was found to vary across the weeks of the month, and the days of the week. A greater number of trips were observed in the first seven days of the month, attributed to disposable income fluctuations associated with end-of-month salary payment schedules. The mean number of daily service trips provided ranged between 11 and 18 in Kisumu, and 9 and 17 Nakuru, with highest mean trip rates observed on Fridays and Saturdays (see table 1). The majority of service trips provided were perceived by operators to be less than one kilometre in length (81% in Kisumu and 77% in Nakuru) (see table 1).

Table 1. Daily service trips by town, perceived trip distance and day (n=500)

	Kisumu (n=250)				Nakuru (n=250)			
	mean	std. dev.	min.	max.	mean	std. dev.	min.	max.
Monday-Thursday	15.6	2.2	7.0	22.0	14.4	2.6	7.0	20.0
Friday	17.5	2.4	10.0	25.0	15.9	2.9	10.0	25.0
Saturday	18.2	3.1	8.0	25.0	16.9	3.6	0.0	25.0
Sunday	10.5	8.0	0.0	25.0	9.3	7.7	0.0	22.0
Trips by distance								
Trips <1 km ¹	12.7	2.0	3.0	20.0	11.3	3.0	3.0	18.0
Trips 1-3 km	1.7	1.0	1.0	3.0	1.9	0.9	0.0	8.0
Trips > 3 km	1.3	0.5	0.0	3.0	1.4	0.8	0.0	7.0

Notes:

1. The proportion of short trips is somewhat surprising, given that trips of up to one kilometre would normally be regarded as a reasonable walking distance. This suggests that *boda boda* often provide a convenience service to passengers with sufficient means to choose between walking and a bicycle taxi. It should be noted, however, that the trip distance data collected were the perceptions of operators, and it may be that operators routinely underestimated distances.

The mean number of hours worked per day was similar in the two towns (12 hours), with hiring operators working marginally longer hours than owner operators (see table 2). The maximum number of working hours observed was 14. These findings illustrate, on the one hand, that working conditions are physically demanding, and on the other, that services are available throughout the day.

The fares charged by *boda boda* operators were found to be based upon trip lengths. The fare for trips less than one kilometre was KES 10 (ZAR 1.32) in Kisumu, and KES 20 (ZAR 2.64) in Nakuru (see table 3). The fare for trips greater than three kilometres was the same in both towns (KES 30 [ZAR 3.96]). It is posited that the observed difference in the short distance fare in the two towns is due to the superior operator self-organisation in Nakuru (see later discussion on operator associations in section 3.3), which facilitates collusion in fare setting. In the absence of strong operator self-organisation, the consistency of (lower) fares in Kisumu is posited to be result of an equilibrium price arising from free competition. The *boda boda* fare was found to be considerably less than the fares charged by motorcycle taxi and *tuk tuk* operators, across all trip length categories and in both towns (see table 3). *Matatu* fares were found to be marginally higher than *boda boda* fares in Kisumu, and marginally lower than *boda boda* fares in Nakuru.

Table 2. Daily hours worked by town and operator type (n=500)

	Kisumu (n=250)				Nakuru (n=250)			
	mean	std. dev.	min.	max.	mean	std. dev.	min.	max.
Owner operator ¹	11.9	1.3	8.0	14.0	11.6	1.3	8.0	14.0
Hiring operator ²	12.1	0.9	10.0	14.0	11.9	1.2	8.0	14.0

Notes:

1. An 'owner operator' is an operator who owns the bicycle taxi.
2. A 'hiring operator' is an operator who hires the bicycle taxi.

Table 3. Fares by town, trip distance and travel mode (Kenyan Shillings)

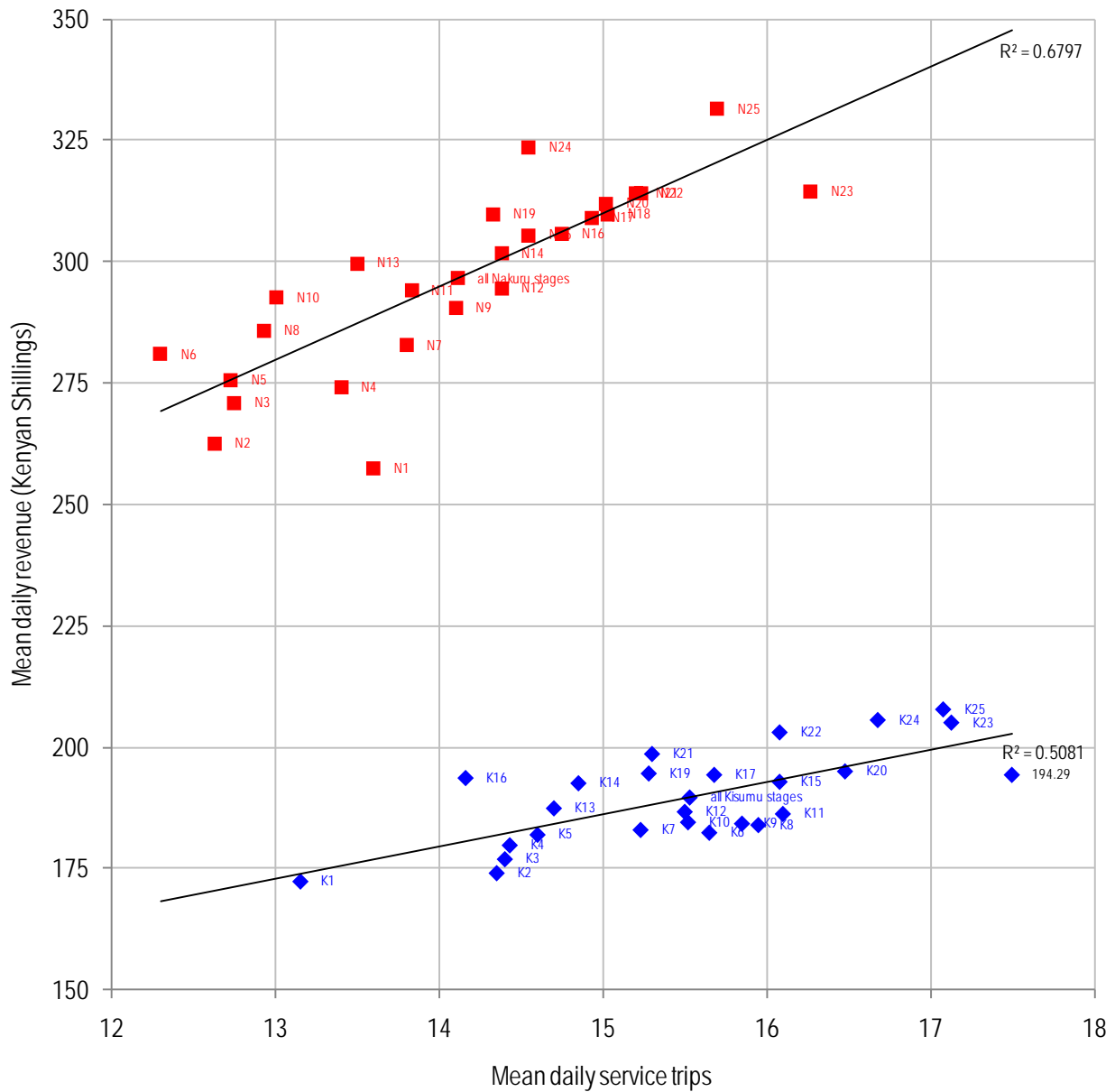
	Kisumu			Nakuru		
	trips <1 km	trips 1-3 km	trips > 3 km	trips <1 km	trips 1-3 km	trips > 3 km
<i>Boda boda</i> ²	10	20	30	20	25	30
Motorcycle taxi ³	40	50	50	40	40	50
<i>Tuk tuk</i> ⁴	50	50	50	–	–	–
<i>Matatu</i> ⁵	20	25	30	20	20	25

Notes:

1. On 5 February 2010, the last day of data collection, ZAR 1.00 was valued at KES 7.58, and USD 1.00 was valued at KES 79.91.
2. In Kisumu, *boda boda* carry in the region of 16% of weekday passenger trips by all travel modes (Makajuma 2006). In Nakuru, *boda boda* carry in the region of 50% of weekday passenger trips by motorised and mechanised travel modes combined (Keter 2009). Assuming a similar walking and cycling share to that of Kisumu (59%), the estimated *boda boda* share of passenger trips by all travel modes and across the entire weekday in Nakuru is in the region of 20%.
3. A motorcycle taxi is a motorcycle which is used to provide 'for hire' transport services usually to one person at a time. As a relatively new phenomenon, no motorcycle taxi modal split data are available for Kisumu or Nakuru.
4. A *tuk tuk* is a three-wheel vehicle with a petrol or diesel engine which is used to provide 'for hire' transport services for one to three people per trip. No data are available with respect to the share of this mode in modal splits in Kisumu and Nakuru.
5. A *matatu* is a mini- or midi-bus taxi which provides paratransit services to between 14 and 40 passengers per trip. In Kisumu, *matatus* carry in the region of 18% of all weekday passenger trips (Makajuma 2006). No *matatu* modal split data are available for Nakuru.

The monthly revenue of operators was imputed in the study on the basis of the number of service trips made, the fares charged, and the costs incurred in maintaining the bicycle (and leasing the bicycle in the case of hiring operators – found to be, on average, KES 1,511/month [ZAR 199.34/month] across both towns). It was found that operator revenue ranged widely, depending on factors such as fares charged, the quality of the bicycle, hiring costs and operating conditions (see table 4). The mean owner operator monthly revenue was imputed to be KES 5,210 (ZAR 687) in Kisumu, and KES 8,117 (ZAR 1,071) in Nakuru. The mean hiring operator monthly revenue was imputed to be

KES 4,492 (ZAR 593) in Kisumu, and KES 8,103 (ZAR 1,069) in Nakuru. It was found, across both towns, that 73% of operators were owner operators, and 27% were hiring operators.



Notes:

1. Kisumu stage names

2. Nakuru stage names

K1	Kboys	K10	Nakumatt	K19	Rassia	N1	Securicor	N10	Head Office	N19	Maindi Choma
K2	Social	K11	Ouko	K20	Ondiek	N2	KFA	N11	Waterbuck	N20	Holy Cross
K3	KCC	K12	Abunga	K21	Makasembo	N3	Menengai	N12	Evans	N21	Zakayas
K4	Tuskys	K13	Kondele	K22	Kicomi	N4	Total	N13	Weavers	N22	Taidys
K5	Jua Kali	K14	Aga Khan	K23	Kibuye	N5	Check Point	N14	Laken	N23	Kolen
K6	KCB	K15	Cresent	K24	Kilimani	N6	CID	N15	Topten	N24	Medical
K7	Mtejula	K16	Sai	K25	Nyaori	N7	Summit	N16	Show Ground	N25	Gulf
K8	Fanana	K17	Swan			N8	Gilanis	N17	Bondana		
K9	Manyata	K18	Harina			N9	Kivumbini	N18	Akamba		

Figure 8. Mean daily service trips vs. mean daily revenue (Kenyan Shillings), by stage and town (n=500)

Figure 8 illustrates the considerable discrepancy between imputed operator revenue in the two towns, for owner and hiring operators combined. The impact of the higher fare regime in Nakuru on operator revenue is clearly demonstrated.

Table 4. Imputed monthly income, expenditure and revenue by town and operator type (Kenyan Shillings, n=500)

	Kisumu (n=250)				Nakuru (n=250)			
	mean	std. dev.	min.	max.	mean	std. dev.	min.	max.
Owner op.: income	5,966	991	2,970	10,553	9,308	1,740	4,366	13,860
Owner op.: expenditure ²	745	47	525	865	679	81	470	840
Owner op.: revenue	5,210	997	2,260	9,833	8,117	1,736	3,656	13,080
Hiring op.: income	5,968	1,024	4,050	7,560	9,499	1,598	4,725	13,345
Hiring op.: expenditure ³	1,528	91	1,350	1,575	1,496	109	1,350	1,575
Hiring op.: revenue	4,492	993	2,521	6,300	8,103	1,693	3,375	12,285

Notes:

1. On 5 February 2010, ZAR 1.00 was valued at KES 7.58, and USD 1.00 was valued at KES 79.91.
2. Owner operator expenditure is the total amount of money spent on the maintenance of the chain, tyres and tubes, braking systems, bearings, rims and spokes, and other bicycle components.
3. Hiring operator expenditure is the total amount of money spent on hiring the bicycle, in addition to selected maintenance expenses.

3.2 Socio-economic impacts

A socio-economic benefit of the *boda boda* industry is the considerable direct and indirect income generating opportunities it creates. If the most recent estimates of the total number of operators are accurate (Cox 2010, Mazuri 2010, Omondi 2007), and assuming that each bicycle taxi is operated by just one person, the *boda boda* industry provides direct employment to 10,000 people in Kisumu and 6,000 people in Nakuru. It was found that the mean number of dependents per operator was 2.5 in Kisumu and 3.2 in Nakuru (see table 6), and that across both towns 97% of the operators had dependants with no alternative source of income. It can thus be estimated that some 25,000 and 19,200 people are directly and largely supported by the industry in Kisumu and Nakuru respectively.

In addition to direct employment, the *boda boda* industry supports various linked enterprises which provide income generation opportunities. It was established that most neighbourhoods of the towns had at least one bicycle repair garage (see figure 9) with one or more mechanics (which in turn are linked to hardware shops stocking bicycle parts). In addition, 'stages' often host kiosks and shops which sell a variety of foodstuffs and merchandise.



Figure 9. A bicycle repair garage (adjacent to Summit 'stage' [N7], Nakuru)

Figure 10. Nakuru Boda boda Group membership numbers (Head Office [N10])

The physically demanding nature of *boda boda* operations precludes the very young, weak or aged from benefiting from the income generating opportunities created. It was found that the mean age of operators in Kisumu and Nakuru was 24 and 27 years old respectively, with the youngest operator recorded at 18 years and the oldest at 45 years (see table 5). Across both towns, 33% of operators were 18-22 years old, 34% were 23-27 years old, 24% were 28-32 years old, and 6% were 33-37 years old. Most operators were found to have received some formal education (see table 6). Across both towns, 25% of operators had less than a Standard 8 education, 48% had Standard 8 certificates, and 26% had Form 4 certificates. Almost all operators are male (it was reported that there were three female operators in Nakuru, but none in Kisumu).

Table 5. Operators by town, age, education level and dependents (n=500)

	Kisumu (n=250)				Nakuru (n=250)			
	mean	std. dev.	min.	max.	mean	std. dev.	min.	max.
Age	24.4	4.7	18.0	45.0	27.0	5.6	18.0	44.0
Number of dependents	2.5	1.6	0.0	7.0	3.2	1.7	0.0	7.0
	< std 8	std 8-fm 4	nat. dip.	total	< std 8	std 8-fm 4	nat. dip.	total
Education level ¹	34%	66%	0%	100%	16%	83%	1%	100%

Notes:

1. In the Kenyan schooling system, Standards 1 to 8 are the equivalent of South African Grades 1 to 8, and Forms 1 to 4 are the equivalent of South African Grades 9 to 12.

3.3 Regulatory and support measures

In Nakuru *de jure* quantity regulation takes the form of an outright ban, introduced in 2007, of bicycle taxi operations within the central business district (access through the area must be on foot, pushing the bicycle). In contrast, in Kisumu, bicycle taxi operations are allowed everywhere. Both the Kisumu City Council (KCC) and the Nakuru Municipal Council (NMC) have formulated and approved bicycle taxi operating by-laws, made up of rules and penalties relating to operating permission, operating hours, bicycle roadworthiness and driver behaviour (Kisumu City Council 2008, Municipal Council of Nakuru 2008). These by-laws have never been implemented or enforced in either town (Keter 2009, Mazuri 2010).

In Kisumu, Njenga and Maganya (1998) report the existence of a well organised operator association known as the Kibos-Nguware Bicycle Taxi Association in the late 1990s, and McCormick (2010) noted the existence of a Kisumu Nguware Transport Group as recently as 2006. However, none of the 250 Kisumu operators interviewed in the survey indicated

membership of an operator association, and no associations were reported to be active in an interview with the City Engineer (Mazuri 2010).

In contrast, in Nakuru all operators were found to be members of an operator association known as the Nakuru Boda boda Group (NBG), which is officially recognised by the NMC and provides a form of *de facto* pricing and quality self-regulation. The NBG is managed by a committee selected by members. Its function is to enforce 'operational discipline' on its members, to defend them when arrested by NMC officials, and to negotiate with the NMC in the case of disputes. The NBG operates from an office, provided by the NMC, located outside the central business district. It was found to charge each joining member a once-off membership fee of KES 500 (ZAR 66), for which the member receives a membership number which must be displayed on the bicycle taxi at all times for identification and enforcement purposes (see figure 10). It has formulated a set of 21 rules relating to a code of conduct with respect to cleanliness, sobriety, theft and the display of membership numbers, which are given to each member upon joining. Operators who break these rules are fined.

In addition to NBG membership, it was found that Nakuru operators were required to pay a monthly operating fee of KES 360 (ZAR 47) to the NMC. The NBG members have refused to pay this fee, however, since being banned from operating within the central business district (representing a loss of income to the NMC of approximately KES 2,160,000/month [ZAR 285,000/month]). However, it was reported in interviews that whenever operators are arrested for offences they are forced to pay the operating fees for that month as well as settling the fine for the offense committed. In Kisumu operators were required to pay a monthly operating fee of KES 300 (ZAR 40) to the KCC, but refuse to pay this for no explicitly stated reason (representing a loss of income to the KCC of approximately KES 3,000,000/month [ZAR 396,000/month]). Thus in neither town is the regular payment of municipal operating fees enforced.

Table 6(a-c). Operator perceptions with respect to operational problems, attitudes of others, and desired support, by town (n=500)

(a) Operational problems		Kisumu (n=250)		Nakuru (n=250)	
Biggest problem confronting operations	on-road conflicts with vehicular traffic	99%		9%	
	area bans which limit access to passengers	1%		57%	
	absence of suitable pick-up and drop-off areas	0%		34%	

(b) Authority and other operator attitudes		Kisumu (n=250)			Nakuru (n=250)		
		friendly	indifferent	hostile	friendly	indifferent	hostile
Perceived attitudes towards <i>boda boda</i> services	traffic police	29%	57%	14%	33%	49%	18%
	<i>matatu</i> operators	4%	42%	54%	10%	29%	61%
	intercity bus operators	46%	53%	1%	52%	46%	2%

(c) Desired support		Kisumu (n=250)		Nakuru (n=250)	
Most desired type of support from Government	provision of designated stages	30%		57%	
	formulation of operating policies	42%		21%	
	facilitation of loans to purchase vehicles	29%		22%	
Most desired type of support from the NGO and private sector	facilitation of loans to purchase vehicles	50%		50%	
	improvement of business management skills	50%		50%	

3.4 Operator attitudes

Table 6 presents the attitudes and perceptions of *boda boda* operators with respect to the biggest operational problems they face, their perception of the attitudes that traffic police and other operators have towards them, and the most desired type of support from public, non-governmental and private sectors. On-road conflict with vehicular traffic (and associated safety risk) was the dominant operational problem noted amongst Kisumu operators, and the town centre ban amongst operators in Nakuru. In interviews, 95% of Nakuru operators reported reduced earnings as a result of the town centre ban. In both Kisumu and Nakuru (perhaps surprisingly given the town centre ban), most operators indicated that the traffic police were friendly or indifferent towards them. Most operators in both towns felt that intercity bus operators were not hostile to them, probably because they are perceived to provide complimentary feeder and distribution services. On the other hand, most operators in both towns felt *matatu* operators were hostile to them, probably because they are perceived to be unwanted competition. When questioned on the most important aspects of their operations requiring support from government agencies, the need for more sympathetic municipal operating policies (dealing with operating zones and providing official recognition) was most commonly mentioned in Kisumu, while the provision of designated 'stages' (particularly in the town centre) was dominant in Nakuru. Equal numbers of operators in both towns indicated that they desired support in developing their businesses, and in securing soft loans for vehicle purchases (with a government micro-credit scheme for *boda boda* operators introduced in Nairobi in 2004 [the State Loans for Cycle Venture] providing some precedent here [Cox 2010]), from both non-governmental organisations and the private sector.

4 CONCLUSIONS AND RECOMMENDATIONS

The main objectives of this study were to understand the role played by, and challenges facing, *boda boda* services, and to explore the measures that might be formulated by the relevant authorities to better manage and support them.

With regard to the role of, and challenges facing, *boda boda* services, it is concluded that *boda boda* occupy a particular passenger niche market. This niche takes the form of relatively inexpensive and short 'for hire' service trips largely for the purposes of accessing work activities (directly, or as a feeder and distribution service within a multi-mode trip), and off-road trips in high density unplanned settlements where higher capacity *matatu* and *tuk tuk* vehicles cannot pass. Their small road space requirements and ability to pass slow-moving or stopped motor vehicles enable them to operate efficiently and competitively in congested networks. They also provide an inexpensive means of transporting medium weight packaged goods to and from markets. It is argued that *boda boda* bicycle taxis have a place in Kenyan urban transport systems, and their absence would leave service gaps, leave many people without a source of income, and worsen air quality. *Boda boda* operators face many physical, viability, and safety challenges, most of which are directly linked to a poor operating environment (i.e. no bicycle lanes or boarding and alighting space, and no officially designated 'stages'). It is argued that *boda boda* operations should be facilitated and supported by the relevant public authorities. The study found that in Kisumu and Nakuru, no support measures, and little *de jure* regulation, are in place.

The recent observed (but largely unquantified) increase in motorcycle *boda boda* operations in the case towns (see figure 11), at the expense of *boda boda* market share, is a cause for concern, and it is recommended that the local authorities adopt a clear policy

position in this regard. On the basis of available evidence, it would appear that this trend should be resisted, at least with respect to the niche market bicycle *boda boda* currently serve. Motorcycle *boda boda* operations may be less physically demanding and enable a greater number of daily service trips, but they introduce or worsen negative air quality and road safety externalities relative to bicycle *boda boda*. The increased velocity associated with motorcycle collisions increases safety risks, and the poor safety record of motorcycle taxis is well documented elsewhere (Cervero 2000, Ngim and Udosen 2007). The impact of motorcycles on air quality is also well documented elsewhere, generally found to produce more harmful emissions per kilometre than cars (McDonald *et al* 2005). The distribution of poverty alleviation benefits can also be argued to be less than that of bicycle *boda boda*, on the grounds that market entry costs are so much lower – the cost of the cheapest motorcycle in Kenya is more than ten times that of a bicycle. Further research is required in Kisumu and Nakuru to better understand motorcycle *boda boda* operations, externalities and poverty alleviation impacts relative to bicycle *boda boda*, to provide a sound evidence base upon which a clear policy position can be taken.



Figure 11. Motorcycle taxi (Nairobi Road, Kisumu)



Figure 12. Class 2 bicycle lane infrastructure in Kakamega

With regard to measures that might be formulated to better support and regulate *boda boda* operators, the following recommendations are made: Firstly, that the local authorities initiate a planning process to provide dedicated road space in the form of class 2 bicycle lanes and ancillary infrastructure (see figure 12 for precedent of such lanes in Kakamega), strategically located on high volume *boda boda* routes, in order to increase the riding, boarding and alighting safety of passengers and operators. Such facilities should be shared with cyclists. Secondly, it is recommended that municipal by-laws governing the use of bicycle infrastructure are implemented and enforced. It is possible that the provision of supporting infrastructure, and the enforcement of regulations that manage its use, would result in a greater willingness on the behalf of operators to pay the currently ignored monthly municipal operating fees in Kisumu and Nakuru, and this revenue could be hypothecated for bicycle infrastructure provision and maintenance. Willingness-to-pay studies amongst operators would be required to test this. Thirdly, it is recommended, as part of the aforementioned by-laws, that the local authorities ensure all *boda boda* bicycle taxis have at least third party insurance cover (East African precedent for such third party insurance requirements can be found in Kampala [Aanyu 2007]). Fourthly, given the fare-setting and viability advantages apparent in the earlier comparison of Kisumu and Nakuru operator revenues, as well as the potential self-regulation benefits, it is recommended that steps are taken to assist in the reinvigoration or formation of operator associations where they are not active, and promote association membership amongst all operators, in order to facilitate constructive interactions with authorities and better financial terms resulting

from collective negotiations with credit and hardware providers. With respect to the latter, possibilities exist to increase operator viability by introducing higher capacity three-wheeler pedicabs (as, for instance, introduced recently in Cape Town [Phillips 2010]). Fifthly, an overarching recommendation is the formulation of a comprehensive national non-motorised transport policy, which addresses matters relating to bicycle taxi operations, and provides harmonised guidance to local authorities in urban and rural areas on the modalities of formulating, funding and implementing local bicycle taxi policy interventions.

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