

Nonmotorized Vehicles in Metropolitan Manila: Return of the Pedicabs

DEREK DYLAN BELL AND CHIAKI KURANAMI

Metropolitan Manila, the capital city of the Philippines, is located on Luzon Island and consists of four cities and 13 municipalities. In the 1960s and 1970s incomes were on the increase and the popular pedicabs (the local term for bicycles with sidecars that serve as nonmotorized taxis) of the 1950s were increasingly motorized (this motorized version of the pedicab is called a tricycle). However, the almost extinct pedicabs reappeared during the early 1980s at the time of the Ferdinand Marcos economic downturn and quickly regained popularity. Though not favored by government officials, pedicabs are popular with some residents and account for about 20 percent of all vehicle traffic in areas of nonmotorized vehicle (NMV) use. The pedicabs are joined by other NMVs such as handcarts, bicycles, and calesas (two-wheeled horse-drawn carriages). All of these NMVs have been on the increase recently, in part because of the structurally weak Philippine economy. As long as the unemployment situation does not improve and urban migration is not controlled, NMVs will provide a source of employment and means of livelihood. The number of poor people in metro Manila has been increasing in the past few years with little sign of abatement, and this has coincided with an increase in the number of pedicabs. Consequently, the national and local governments need to address this issue through balanced transport planning and the provision of a low-cost NMV transportation infrastructure.

The Philippines has a current population of 64.3 million. Metropolitan Manila, the largest and most densely populated region in the nation, has a population of 8.4 million and a population density of 13,160 residents per square kilometer. The average annual growth rate of this region's population from 1980 to 1985 was 3.1 percent, which decreased to 2.8 percent from 1985 to 1990. This trend is expected to continue in the future as the growth rate from 1990 to 1995 is forecast to be 2.4 percent. Rural migration is high: 45 percent of the nation's work force is in agriculture. The poorest of these migrants live in slums and squatter areas with no electricity or running water. The average household size in metro Manila is 5.4 persons (1, p.60).

The country's gross domestic product (GDP) per capita was \$730 (U.S.) in 1991 (2, p.238). The country experienced a negative GDP growth rate of -1.0 percent and an inflation rate of 17.7 percent in the same year (3, p.134). These economic woes were combined with political uncertainties until early June 1992, when voters picked Fidel Ramos to succeed Corazon Aquino as President of the Philippines. The stagnating economy is partly a result of chronic electric power failures, which affect the operations of traffic signals and gasoline stations.

TRANSPORTATION INFRASTRUCTURE

In metro Manila, there are 2980 km of roads, about 85 percent of which are paved. The main thoroughfares are in relatively good physical shape, but many of the side streets are in poor condition with broken pavement and numerous potholes. A lack of adequate pedestrian facilities has made travel by foot very dangerous, and pedestrians make up the majority of traffic accident fatalities. Along side streets, many of which are narrow with parked vehicles lining both sides, large motorized vehicles (MVs) have difficulty maneuvering. As a result, many nonmotorized vehicles (NMVs) can be found here. In general, there is a lack of well-developed secondary roads to support the reasonably good thoroughfares in metro Manila.

Drainage along side streets is insufficient, and flooding is a problem. In some roadways water is knee-deep during rainstorms. When this flooding occurs, pedicabs are the most reliable form of transportation for short distances, distances that people normally walk but do not because of the flooding.

VEHICLE OWNERSHIP

Handcarts

With the 1992 water shortage in metro Manila, handcarts increasingly were used to haul water in containers sold to residents in subdivisions or low-cost housing communities. Handcarts are also used for solid waste collection and waste paper recycling (Figure 1). For example, the Kaunlaran Multi-Purpose Cooperative, organized in 1991, with financing from the Development Bank of the Philippines (DBP), owns about 30 handcarts for collecting waste paper from households based in Barangay Kaunlaran of Quezon city. Each handcart has a capacity of about 100 kg. The kariton (cart) boys are given some initial business capital by the cooperative in the amount of 200 pesos (\$8) a day. This money enables them to buy waste paper and old magazines and newspapers, which they sell to the cooperative. The cooperative, in turn, sells these items to paper mills for recycling.

The cooperative's undertaking is basically a buy-and-sell business that aims to provide unemployed and out-of-school youths with a source of income and to combat growing poverty. Members pay a one-time 20-peso (\$0.80) membership fee and are required to take paper management seminars or training programs sponsored by PULPAPEL, an association of private pulp and paper companies. These seminars and programs teach paper sorting, grading (for price estimation), and basic accounting. Other regularly held seminars are sponsored by the Board of Investments and the DBP. Many of the members have been able to succeed, and additional handcarts have been purchased at 600 to 900 pesos (\$24 to 36) each.

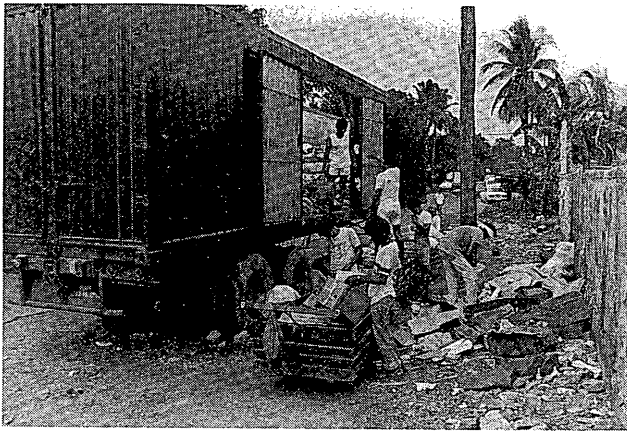


FIGURE 1 Kariton (cart) boys involved in wastepaper recycling.

The cooperative, which is supported by paper mills in terms of technical management, is assured a market for the waste paper it collects. The NMVs (handcarts) are a cheap form of transport for the buy-and-sell business of the cooperative, enabling it to undertake the dual function of being a private enterprise and a civic-oriented organization for assisting out-of-school youths and the unemployed. About 10 kariton boys deliver waste paper daily. Expansion plans are being pursued by the cooperative's management to reach out to other barangays (organized residential communities forming the smallest political subdivisions in the Philippines). The cooperative has acquired a six-wheeled truck to complement its handcarts in delivering 3 or 4 tons of waste paper two to three times a week to the paper mills.

Calesas

Calesas (Figure 2) are very limited in number primarily because they are relatively expensive to maintain and cater mainly to tourists. About 20 years ago calesas were very popular, but now they have been all but replaced by motorized jeepneys. Some local residents, especially store owners in Chinatown, still prefer calesas, which has helped ensure their limited survival.



FIGURE 2 A typical calesa.

Bicycles

Bicycles are not registered in metro Manila, and there are no good records of their numbers. The figure in Table 1 is a best guess based on the estimates of government officials and the results of field surveys.

An increasing number of private messenger services use bicycles. In the early 1980s the government bought thousands of bicycles and distributed them to postal employees in metro Manila and the surrounding provinces on an installment basis, but this program was halted quickly without review.

Pedicabs

Determined by local government staff, the allotted numbers of pedicabs (Figure 3) per district in metro Manila are based on the "measured capacity" or the estimated number of people requiring service. Because the number of pedicabs in operation is two to three times higher than the number registered, the figure in Table 1 was estimated on the basis of registered and estimated unregistered numbers for Manila, Quezon city, and Makati expanded to metro Manila.

Most of the bicycles used for pedicabs come from Taiwan. The size and quality of the pedicab sidecars depend on the type of bicycle used. Pedicabs are basically bicycles (similar to mountain bikes) with a sidecar (sometimes covered, with or without seats).

Motorized Vehicles

Tricycles are powered mostly by Japanese motorcycles with engine displacements of 80 to 125 cc. Sidecars are produced locally by a variety of manufacturers, usually separate from motorcycle manufacturers. The sidecar can be mounted to the motorcycle by numerous mechanical shops throughout metro Manila. Tricycles and motorcycles combined represent only 9.7 percent of all registered MVs in metro Manila.

Jeepneys, which account for 37 percent of all registered MVs, are produced entirely in the Philippines. They are built primarily by hand in small auto body shops throughout metro Manila and neighboring areas. Many of these jeepneys are decorated lavishly with various accessories such as antennas, lights, curtains, and mirrors. Officials at the Department of Transportation and Communications (DOTC) estimate that there are far more jeepneys operating as "public utilities" than the 27,659 units registered as such.

Although metro Manila contains only 7.7 percent of the nation's population, it accounts for 68 percent of all automobiles, 52 percent of all trailers, 41 percent of all jeepneys, 34 percent of all trucks, 29 percent of all buses, and 17 percent of all motorcycles and tricycles. Automobile and jeepney ownership levels in 1990 were 39 and 32 per 1,000 population, respectively, whereas the level for motorcycles and tricycles combined was only 8.3 per 1,000 population.

NMV USE

Modal Split

According to surveys performed in 1984, metro Manila was an MV-dependent city—less than 1 percent of all person trips were made

TABLE 1 Vehicles by Type in Metro Manila, 1990

Classification	Vehicle Type	Number	Per Cent of Motorized Vehicles	Per Cent of Non-Motorized Vehicles
Private	Bicycle ^a	100,000	-	100.0%
	M/C & Tricycle ^b	48,413	8.1%	-
	Automobile	288,736	48.4%	-
	Jeepney	212,017	35.5%	-
	Bus	746	0.1%	-
	Truck	40,225	6.7%	-
	Trailer	6,632	1.1%	-
	Subtotal	696,769	100.0%	100.0%
For Hire	Pedicab ^c	5,500	-	95.7%
	Calesa ^d	250	-	4.3%
	M/C & Tricycle	16,418	26.8%	-
	Automobile	8,150	13.3%	-
	Taxi	1,715	2.8%	-
	Jeepney	27,659	45.1%	-
	Bus	4,329	7.1%	-
	Truck	2,532	4.1%	-
	Trailer	477	0.8%	-
	Subtotal	67,030	100.0%	100.0%
Total ^e	Bicycle	100,000	-	94.6%
	Pedicab	5,500	-	5.2%
	Calesa	250	-	0.2%
	M/C & Tricycle	66,577	9.7%	-
	Automobile	306,959	44.8%	-
	Jeepney	251,635	36.7%	-
	Bus	5,247	0.8%	-
	Truck	44,892	6.6%	-
	Trailer	9,468	1.4%	-
	Total	790,528	100.0%	100.0%

^aEstimate based on discussions with local and national government officials.

^bMotorcycles and tricycles are not categorized separately by the DOTC.

^cEstimate based on registered numbers.

^dEstimate based on field surveys and discussions with government officials.

^eTotals may be greater than the sum of private and for-hire vehicles because of other categories, such as government-owned and diplomatic vehicles, not detailed above.



FIGURE 3 Pedicabs outside a light-rail station.

by NMVs (excluding walking). Mass public transit accounted for 15 percent, and most trips were made by automobile, jeepney, taxi, and other forms of low-capacity motorized transit (4, p.55).

Recent traffic counts in 12 locations in metro Manila, however, indicate that the share of NMVs is much higher, up to 34 percent in areas with frequent NMV use, with handcarts, bicycles, and calesas each accounting for a 4 to 5 percent mode share (5). The figure for calesas is slightly high since three of the locations in metro Manila were in Chinatown, which still has many calesas in operation. At these three locations calesas made up 16 percent of all vehicles (Table 2).

Metro Manila is unusual for a major city in Southeast Asia in that it has a relatively low number of motorcycles, and very few bicycles are used. In addition, it is clear from Table 2 that pedestrian activity is relatively high. This finding is supported by several surveys performed in the 1980s (6, p.4). In terms of vehicle use, automobiles/jeeps/taxis are most common with pedicabs and jeepneys

TABLE 2 Traffic Composition on 12 Typical NMV-Use Roads in Metro Manila

Mode	Total (Per Cent)	Per Cent of Vehicular Traffic	Per Cent of Motorized Vehicles	Per Cent of Non-Motorized Vehicles
Pedestrian	1,419 (33.4%)	-	-	-
Handcart	133 (3.1%)	4.7%	-	13.9%
Bicycle	147 (3.5%)	5.2%	-	15.4%
Pedicab	564 (13.3%)	19.9%	-	59.1%
Calesa	110 (2.6%)	3.9%	-	11.5%
Motorcycle	150 (3.5%)	5.3%	8.0%	-
Tricycle	17 (0.4%)	0.6%	0.9%	-
Auto/Jeep/Taxi	1,006 (23.7%)	35.5%	53.9%	-
Jeepney	447 (10.5%)	15.8%	23.8%	-
Truck	213 (5.0%)	7.5%	11.3%	-
Bus	45 (1.1%)	1.6%	2.4%	-
Total	4,251 (100.0%)	100.0%	100.0%	100.0%

placing second and third, respectively. The number of tricycles is quite low, largely because of the selection of survey locations and local government requirements that pedicabs operate in non-tricycle use areas (discussed later).

Reasons Pedicabs Are Preferred

Results from a recent pedicab user survey (5), summarized in Table 3, indicate a substantial reliance on pedicabs for a majority of users. The typical pedicab user is in an area not served by bus, does not own an automobile, is either commuting or shopping, and is traveling a distance of 1 km.

As for the reasons users gave for patronizing pedicabs, 72 percent of all users' responses were that pedicabs are less time-consuming and that the users do not want to walk. Both of these answers are similar in meaning since "do not want to walk" can be understood as implying that users would prefer a quicker means of transport. Only 17 percent of those responding that they did not want to walk cited the hot weather as a major factor.

The lack of bus or jeepney service reportedly caused 22 percent of the users to choose the pedicab. Clearly, a lack of bus service is not the main reason for patronizing pedicabs. For users who could have chosen to ride a bus rather than a pedicab, the two responses were "destination is near" and "bus is too crowded." These two answers likely reflect the main reasons that bus service is inferior for short-distance trips.

About a quarter of the respondents answered that they have an automobile in the household but prefer not to drive because "the destination is near," "the roads are too crowded," or "there is no parking available." Here again it is apparent that pedicabs are considered superior for short trips and in congested areas where maneuvering and parking conventional MVs is difficult.

Characteristics of Travel by Pedicab

An overwhelming number of pedicab users make shopping trips or commute between their homes and work places. Also common were trips between shopping areas and work places. No one was using a

pedicab for school trips or for sightseeing. Pedicabs in metro Manila, unlike calesas, are rarely patronized by tourists.

The next item concerns the frequency of pedicab use. To better understand how often these NMVs are used and thus their relative importance in meeting daily travel needs, users were asked how many times each week they hire a pedicab. More than 29 percent of all users patronize pedicabs daily, and only 1.4 percent use a pedicab less than once a week. The average number of pedicab trips per user is four per week.

Patrons were then asked to provide the travel times for their pedicab trips. This information allows one to determine the average travel time and trip length of pedicabs for comparison with other forms of public transportation. As shown, the majority travel for 5 min or less in a pedicab. Considering that the average speed of pedicabs in traffic is 10 km/hr, this corresponds to a distance of less than 1 km.

An occupancy count survey was also performed to determine the average number of passengers per pedicab. Most carry two passengers. Although it is illegal, 19 percent of all pedicabs were observed carrying three passengers, often one adult with two children. Basically, no pedicabs were observed empty because they wait at designated terminal points to pick up passengers rather than cruising for patrons.

Safety and Accidents

Traffic is very congested and chaotic in metro Manila. People are constantly using their horns, and one observes MVs advancing in stop-and-go jerking movements, weaving in and out of lanes, and even straddling two lanes. Jeepneys often delay traffic by stopping in the middle of the road to let passengers board or alight. Conditions are exceptionally bad during brownouts, when many traffic signals stop working.

As one might expect, the number of people killed in traffic accidents is very high in metro Manila and corresponds to a fatality rate of 17.9 per 100,000 population. Many of these fatalities are the result of MVs striking pedestrians. The specific type of vehicles involved in traffic accidents is detailed in Table 4 for the area that encompasses the city of Manila, Quezon city, and Makati municipality, accounting for 49 percent of metro Manila's population.

TABLE 3 Pedicab User Survey Results in Metro Manila, 1992

<u>Why People Use a Pedicab</u>	<u>Per Cent</u>	
Less Time-Consuming	37.9%	
Do Not Want to Walk	33.6%	
No Bus or Jeepney Service	22.1%	
More Convenient	6.4%	
Total	100.0%	
<u>Why Pedicab Users Do Not Ride a Bus</u>	<u>Per Cent</u>	
No Service	95.7%	
Destination is Near	2.9%	
Bus is Too Crowded	1.4%	
Total	100.0%	
<u>Why Pedicab Users Do Not Drive an Auto</u>	<u>Per Cent</u>	<u>Per Cent of Auto Owners</u>
No Auto in the Household	75.7%	-
Destination is Near	10.7%	44.1%
Roads are Too Crowded	7.1%	29.4%
No Parking Available	6.4%	26.5%
Total	100.0%	100.0%
<u>Trip Purpose of Pedicab Users</u>	<u>Per Cent</u>	
Home to Shop/Shop to Home	51.4%	
Home to Work/Work to Home	42.9%	
Work to Shop/Shop to Work	5.7%	
Total	100.0%	
<u>Trip Frequency of Pedicab Use</u>	<u>Per Cent</u>	
Daily	29.3%	
5-6 Times a Week	11.4%	
3-4 Times a Week	21.4%	
1-2 Times a Week	36.4%	
Infrequently	1.4%	
Total	100.0%	
<u>Pedicab Travel Time per Trip</u>	<u>Per Cent</u>	
1-2 Minutes	2.1%	
2-5 Minutes	52.1%	
5-10 Minutes	39.3%	
10-15 Minutes	6.4%	
Total	100.0%	
<u>Number of Passengers per Pedicab</u>	<u>Per Cent</u>	
One Passenger	28.6%	
Two Passengers	52.9%	
Three Passengers	18.6%	
Total	100.0%	

Although the number of pedestrians involved in the total number of accidents is low, pedestrians' share of fatalities and injuries is quite high. This is also true of bicycles and pedicabs, though to a much lesser degree. Automobiles and jeeps for private use are most often involved in all types of traffic accidents. Vehicles involved in fatal traffic accidents at rates significantly below their observed traffic shares are calesas, bicycles, pedicabs, and jeepneys. Those with fatality rates exceeding their traffic shares are buses and a combination of automobiles, jeeps, and taxis.

The argument that NMVs are unsafe and pose a threat to motorized traffic appears baseless according to data on reported traffic accidents. From these data, it is clear that the biggest issue should be the safety of pedestrians from accidents caused by MVs since this accident type accounts for most traffic accident fatalities. Automobiles, jeeps, and buses are the vehicles with the highest accident rates, and they should be the targets of traffic safety campaigns.

COSTS AND FARES

Acquisition Prices

Second-hand bicycles and pedicabs cost about 1,000 and 2,800 pesos (\$40 and \$112), respectively (Table 5). Foreign-made bicycles and bicycle parts are subject to import duties of 50 and 20 percent, respectively. Tricycles are considerably more expensive, with an average second-hand price of 20,000 pesos (\$800) and an average new price of 48,000 pesos (\$1,920). This involves the cost of the motorcycle unit and a sidecar, which must be capable of traveling at speeds greater than those of pedicab sidecars. For people with little savings, the pedicab is clearly the most affordable capital investment available. Jeepneys, by contrast, are the most expensive at about 400,000 pesos (\$16,000) for a second-hand vehicle and 1,600,000 pesos (\$64,000) for a new one. As a result, most jeepney drivers do not own but instead rent the vehicles they operate for hire.

TABLE 4 Vehicles Involved in Traffic Accidents in the City of Manila, Quezon City, and Municipality of Makati, 1991

Vehicle Involved	Type of Accident ^a			
	Fatal (Per Cent)	Injury (Per Cent)	Property Damage (Per Cent)	Total (Per Cent)
Pedestrian	116 (40.3%)	1,252 (35.9%)	86 (0.4%)	1,454 (5.8%)
Handcart	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Bicycle or Pedicab	14 (4.9%)	45 (1.3%)	110 (0.5%)	169 (0.7%)
Calesa	0 (0.0%)	0 (0.0%)	2 (0.0%)	2 (0.0%)
Motorcycle	7 (2.4%)	141 (4.0%)	1,247 (5.8%)	1,395 (5.5%)
Tricycle	2 (0.7%)	77 (2.2%)	253 (1.2%)	332 (1.3%)
Private Auto	32 (11.1%)	526 (15.1%)	9,645 (45.1%)	10,203 (40.6%)
Private Jeep	44 (15.3%)	508 (14.6%)	3,363 (15.7%)	3,915 (15.6%)
Private Trailer	1 (0.3%)	114 (3.3%)	279 (1.3%)	394 (1.6%)
Taxi	9 (3.1%)	4 (0.1%)	4 (0.0%)	17 (0.1%)
Jeepney	18 (6.3%)	259 (7.4%)	2,514 (11.8%)	2,791 (11.1%)
Truck	13 (4.5%)	204 (5.9%)	1,094 (5.1%)	1,311 (5.2%)
Bus	29 (10.1%)	258 (7.4%)	2,265 (10.6%)	2,552 (10.1%)
Mil/Gov't Vehicle	3 (1.0%)	98 (2.8%)	509 (2.4%)	610 (2.4%)
Total	288 (100.0%)	3,486 (100.0%)	21,371 (100.0%)	25,145 (100.0%)

^aData was obtained from the Traffic Engineering Center, Quezon City Traffic Police Station, and Makati Traffic Police Station.

Fares in Public and Freight Transportation

Most pedicabs and tricycles in metro Manila are for public transit use, but some are equipped with a simply constructed sidecar used for transporting goods. Passenger fares are fixed by each local government for the registered pedicabs in its domain. Tricycle, taxi, and jeepney fares are under the control of the national government. Rates for goods movement are not controlled and are therefore subject to negotiation.

In the city of Manila, pedicabs are authorized to follow the fares prescribed by the Land Transportation Franchising and Regulatory Board for tricycles. This fare is 2.00 pesos (\$0.08) for the first kilometer of travel and 0.50 pesos (\$0.02) for every kilometer thereafter. In Quezon city, the rates are specified according to local ordinance at 1.00 pesos for the initial kilometer and 0.20 pesos for each additional kilometer.

However, from the field surveys, it is apparent that pedicabs rarely charge such low fares. In one area of the city of Manila, pedicab drivers charge local users a minimum of 5.00

pesos (\$0.20) for 0.5 km, and beyond that they charge 10 to 20 pesos depending on the distance. In Chinatown, where most pedicabs and calesas are hired for short-distance travel and often for moving cargo, fares range from 25 to 100 pesos per trip depending primarily on the weight of the cargo. Fares are more tightly controlled in Quezon city and Makati, where the costs per trip per passenger are 1.50 to 7.00 and 3.00 pesos, respectively. After paying for their daily boundary costs (discussed later), pedicab operators in metro Manila net at least 85 to 165 pesos (\$3.40 to \$6.60) a day.

During flooding, pedicab drivers charge up to 10 times their normal rates because of significantly increased demand. Clearly, fare regulations have had little influence on the actual fares being charged. Pedicab operators can take advantage of the situation because people in some areas have no alternative mode available, not even walking. Tricycles stall out in flooded areas, and other public transit vehicles simply avoid traveling on routes affected. One could conclude that the inadequate drainage infrastructure in metro Manila helps support the survival of pedicabs.

TABLE 5 Prices of Different Vehicles in Metro Manila, 1992 (Pesos)^a

Vehicle Type	New Vehicles		Second-Hand Vehicles	
	Price Range	Average Price	Price Range	Average Price
Bicycle	2,500 - 10,000	4,500	1,000 - 2,000	1,300
Pedicab	4,500 - 8,000	6,500	2,800 - 4,000	3,500
Motorcycle	30,000 - 100,000	45,000	no data	18,000
Tricycle	40,000 - 55,000	48,000	no data	20,000
Automobile	375,000 - 1,500,000	800,000	no data	200,000
Jeepney	700,000 - 2,000,000	1,600,000	no data	400,000

^aEstimated by DOTC officials; US\$ 1 = 25 pesos.

Annual Registration Fees

Although bicycles for personal use are not registered, pedicab operators and drivers are required to register their units with the local government office. The procedures of pedicab registration vary by local government, as do registration fees. In the city of Manila, the annual pedicab registration fee is 170 pesos (\$6.80), of which 10 pesos is actually for vehicle registration, 10 pesos pays for a license enabling the pedicab to operate as a public utility and carry passengers for a fee, and 150 pesos is for the driver's license. In Quezon city, the annual registration fee is 250 pesos (\$10), which is the same rate applied to tricycles at the local government level. The rate in Makati is 285 pesos (\$11.40).

Tricycles are required to register with both the national and local governments. Local government procedures vary as the Land Transportation Office (LTO) of the DOTC requires a permission note from the respective local government before tricycle registration. This permission note costs about 40 pesos (\$1.60) per year, but some local governments require local registration, which costs about 250 pesos per year and then serves as a permission note for the LTO. The national government fees for tricycles total an additional 450 pesos (\$18). As a result, pedicabs are much cheaper to register than tricycles.

Operating and Maintenance Costs

Average annual operating and maintenance costs for all vehicles except trucks were calculated on the basis of data provided by LTO and previous transportation studies in metro Manila (7). As shown in Table 6, NMVs except for calesas are very cheap to operate and maintain compared with MVs. A pedicab costs less than 6 percent as much as a tricycle at only 800 pesos (\$32) a year in contrast to 15,000 pesos (\$600) a year, respectively. Calesas are relatively expensive since the cost of feeding and caring for a horse is involved. This high cost also explains why their numbers have dwindled.

One reason that pedicabs have become more popular, according to government officials, was the sudden increase in gasoline prices after the Gulf War. Gasoline prices soared from 8.00 pesos/liter to 12.75 pesos/liter, an increase of 59 percent. As of June 1992, gasoline prices leveled off at about 11 pesos/liter (\$1.67/gal). Government officials have indicated that this increase in gasoline prices was followed by an increase in the number of pedicabs operating in metro Manila. Many people previously operating tricycles switched

back to pedicabs. These people were joined by a larger number of new entrants into the pedicab service market.

Rental Charges

Most pedicab drivers rent vehicles from their owners, who pay for all maintenance costs. Drivers are charged a daily rent called a "boundary fee," which ranges from 30 to 65 pesos (\$1.20 to 2.60). In some cases, the pedicab driver enters a verbal rental agreement for a longer period of time lasting several months.

NMV REGULATIONS AND ENFORCEMENT

Vehicle Registration

A pedicab owner must be a member of a pedicab operator association to qualify for registration with the city of Manila. These operator associations must, in turn, be registered with the Securities and Exchange Commission. Operators are further required to obtain insurance for third-party liability of at least 10,000 pesos (\$400), which requires an affidavit of ownership. The pedicab driver is required to pass a medical health examination, and both the owner and driver must each provide a certificate of police clearance.

Third-party liability insurance is required for all motorized public utility vehicles throughout the country so that passengers have some form of protection. However, only the city of Manila and Makati municipality impose this rule on pedicabs. Even so, the insurance requirement for pedicab owners is not strictly enforced because insurance coverage tends to be expensive. Along similar lines, the health certificate requirement for pedicab drivers was instituted in 1992 in both the city of Manila and Makati municipality, and the two local governments received numerous complaints about how the required x-rays are too expensive. As a result, this requirement is not enforced either. Police clearance is required by all local governments to ensure that the applicant does not have any outstanding fines or warrants for his/her arrest.

The main reason that local governments decided to register pedicabs was to try to gain greater control over their numbers and operation. The local governments also required pedicabs to register because they wanted passengers to be insured by pedicab owners. During registration procedures in the city of Manila, potential pedicab drivers are even given a seminar on courtesy and safety. Interestingly, the local government of the city of Manila believes that the

TABLE 6 Average Annual Vehicle Operating and Maintenance Costs in Metro Manila, 1992 (Pesos)^a

Vehicle Type	Tires	Lubrication	Fuel	Maintenance	Total
Bicycle	100	-	-	300	400
Pedicab	150	-	-	650	800
Calesa	250	-	-	15,000	15,250
Motorcycle	300	100	5,200	1,150	6,750
Tricycle	850	200	11,550	2,400	15,000
Automobile	1,100	400	22,000	5,300	28,800
Jeepney	3,750	1,750	79,100	14,100	98,700
Bus	36,500	7,100	298,950	38,000	380,550

^aBased on estimates provided by representatives of the DOTC, City of Manila, Quezon City, and Makati Municipality; US\$ 1 = 25 pesos.

creation of these pedicab ordinances in itself caused a boom in the numbers of pedicabs, possibly due to their sudden "official" legitimacy.

Restrictions on NMV Operations

When Ferdinand Marcos was president, he signed a presidential decree prohibiting tricycles and pedicabs from operating on major thoroughfares without placing any restrictions on handcarts, bicycles, or calesas. This holds true today, and one can observe handcarts, bicycles, and calesas on major thoroughfares, with only a few pedicabs and tricycles operating in violation of the law. Calesas are exempt for reasons of tourism promotion.

Pedicabs are also banned on any street allowing maximum speeds greater than 40 km/hr. In the city of Manila, pedicabs are prohibited to operate in areas already served by jeepneys or buses. Quezon city prohibits pedicabs from operating in areas already served by tricycles, jeepneys, or buses. Interestingly, Makati prohibits the operation of calesas. Throughout metro Manila, local ordinances limit the number of pedicab passengers to two.

Enforcement

Enforcement efforts and penalties vary by local government. In the city of Manila, the local ordinance states that violators will be punished by a fine of not more than 200 pesos (\$8), by imprisonment of not more than 6 months, or by both a fine and imprisonment. Pedicabs are not impounded in the city of Manila as ticket issuance and payment are performed on the spot by local traffic police. In Quezon city, one must pay 350 pesos to retrieve an impounded pedicab. However, Quezon city commonly charges a 50-peso fee at the time of incident rather than impounding a vehicle. The municipality of Makati sometimes impounds pedicabs operating in violation of local law but normally charges a penalty of 50 pesos per infraction. Even though the daily net income of pedicab drivers is only 85 to 150 pesos, these fines are considered by government officials to be too low to discourage illegal pedicab operations.

The Makati municipality is unusual in that it employs 30 "traffic enforcers" who patrol the entire municipality and mainly look for illegal pedicabs or tricycles operating on main streets where they are prohibited. This may have helped to keep fares low, but it has not limited the number of unregistered pedicabs operating illegally in the area. According to a recent field survey in Makati, only 32 percent of the more than 500 pedicabs operating in Barangay Bangkal, one section of Makati, were registered.

NMV FACILITIES

The city of Manila has some yellow-striped lanes for bicycles on a few city streets, but these lines are very faded and the lanes are usually filled with MVs because traffic is severely congested. Other than this striping, there are no special facilities provided for NMVs in metro Manila. Specific pedicab terminal (curbside parking areas) are designated by the local governments and are always located in residential areas or along side streets. Pedicabs can also be found parked near light rail transit stations to take passengers to their final destinations.

Although the DOTC encourages schools and offices to provide bicycle parking facilities for students and employees, this is rarely done. There are essentially no bicycle parking facilities in metro Manila. This is also true for pedicabs, which queue along side streets at designated terminal points. Calesas park along curbsides during operating hours, but each requires a stable in the evening for storing the horse. These stables are usually the property of the calesas owner, so there is no direct cost to the driver.

Because transportation plans are normally prepared by the national department of public works, which excludes NMVs from consideration, all roadway designs and plans (including sidewalks) are conceived for motorized transportation. The local governments also ignore NMVs in transportation planning.

GOVERNMENT ATTITUDES

National and local government officials have many negative impressions about pedicab operations in metro Manila. The city of Manila does not want to encourage NMVs and believes that such vehicles can be effective only in residential areas. Otherwise, pedicabs are perceived as traffic hazards, serving to worsen already severe traffic congestion. Many local government officials would like to see pedicabs replaced by pedestrians. Some other opinions are that pedicabs should be standardized, strict enforcement is needed, operating a pedicab is "degrading" work, and all pedicabs should be outlawed.

CONCLUDING REMARKS AND RECOMMENDATIONS

The characteristic of metro Manila residents not wanting to walk short distances will enable pedicab business to continue, especially in locations near public markets, shopping malls, offices, and schools. Even if NMV use on major thoroughfares is effectively controlled, the presence of NMVs will still be felt in areas often visited and in smaller municipalities and *barangays* where they can be used to collect and haul water, solid waste, and other cargoes, either for public service or private enterprise. Handcarts and calesas will continue to be used for hauling cargo since they are the cheapest alternative to taxis or trucks.

Furthermore, as long as the unemployment situation does not improve and urban migration is not controlled, NMVs will provide a source of employment and a livelihood. Driving a pedicab is a relatively cheap and easy way for those with little money to make a living. The number of poor people in metro Manila has been increasing in the last few years, and—surely not by coincidence—so has the number of pedicabs.

Consequently, government officials should consider a plan that would both improve overall transport service and better meet the needs of NMV users. As the authors outlined in previous publications (8–10), this could be accomplished by incorporating NMV facility planning into the conventional urban transportation planning process, thereby providing a framework to supply basic NMV facilities. The simultaneous planning of both MV and NMV facilities enables close integration between transport services, such as bicycle- or pedicab-to-rail as well as an understanding of the patronage that each mode receives and the dynamics of competition and interaction among modes. A good example of this is the current practice of designating pedicab terminals; however, this is only an

initial step toward the MV/NMV integrated planning required in metro Manila.

Measures that should be implemented include (a) an NMV network and routing plan, and (b) spatial separation measures, which can be divided into NMV lanes delineated by pavement markings and NMV lanes designated by barriers. Because motorists in metro Manila are not well disciplined, it is probably necessary to implement the latter by installing a physical barrier. MVs would then be physically prevented from encroaching on the NMV facility. The emphasis should be on low-cost improvements in transportation infrastructure. Temporal separation measures, such as access restrictions during certain hours of the day, should also be considered.

Last, funding constraints in metro Manila have severely limited road transportation improvements. This could be remedied with appropriate transportation infrastructure planning and development projects funded by international aid organizations. When providing funds for such projects, these organizations should take appropriate measures to remedy anti-NMV biases and thereby promote balanced transportation planning.

ACKNOWLEDGMENTS

Most of the information in the paper was gathered as part of the authors' work on the Study of Non-Motorized Vehicles in Asian Cities managed by the World Bank. Consequently, the authors would like to recognize the following World Bank staff for their valuable assistance and involvement with the study: John Flora, Slobodan Mitric, Paul Guitink, Richard Scurfield, Hubert Nove-Josserand, Peter Midgley, and Peter Ludwig. The authors would

also like to extend their gratitude to Theresa Villareal, a local consultant who conducted the many surveys cited in this paper.

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