



By  
Norman Z. Nyazema

***"We cannot solve the problems that we have created with the same thinking that created them" [Albert Einstein]***

INTRODUCTION . . . . .	1
METHODOLOGY . . . . .	4
RESULTS . . . . .	5
Transport Sector and Energy Policy . . . . .	5
Local Government Policy on Cycling . . . . .	7
Cycle ownership, use and attitudes . . . . .	10
Modes of transport . . . . .	14
Road Accidents involving cyclists . . . . .	17
DISCUSSION . . . . .	18
Deterrents . . . . .	20
Current patterns of cycle use . . . . .	22
Pollution of the environment . . . . .	23
CONCLUSIONS . . . . .	26
RECOMMENDATIONS . . . . .	27
Harare City Council, HCC. . . . .	27
ZTSB, HCC and Bicycle Manufacturers . . . . .	29
Police and ZTSB . . . . .	29
Employers . . . . .	30
Cyclists . . . . .	31
REFERENCES . . . . .	33
ACKNOWLEDGEMENTS . . . . .	34

131423

## INTRODUCTION

The phrase "sustainable development" buzzes around politics and economics today, but seldom is the phrase defined and even more rarely is the concept rigorously applied to the future of transport and access issues.

The traditional gauge of "development" has been "GNP" or "GDP". Lately, these have been discredited because of their inability to accurately reflect the "quality of life". An equitable definition and measure of "development" must reflect broad changes in the quality of life, not just the increase wealth of a privileged few. But development can never be "at all costs."

"Sustainability" draws in the environmental considerations and dictates that the system must not only meet the needs and improve the quality of life of today's generation, but must do it without compromising the quality of life of future ones.

Recognize that no human activity (as well as elephant, rhino, whale, seal or hummingbird activity) occurs without some effect on the environment. For "sustainability" we must select actions which, along with their bundles of secondary and tertiary consequences, can heal - preferably from natural, but possibly from constructed systems - within a reasonable period of time.

Funding a sustainable system in transport will require bigger lifestyle changes than reducing water use with low-flow toilets, reusing beverage bottles and recycling paper. To paraphrase Einstein, "We cannot solve our problems with the same technology and lifestyles that created them."

In "more developed countries" and "less developed countries" alike, a keystone of environmental degradations has been roads. In almost every ecological crisis a road figures some place in the scenario. Every mile of road that is graded opens more land to vehicles and signals the spread of high impact human activities.

But don't roads provide access to education, health care employment, and markets - the basis of a better quality of life? How fundamental are roads? In many parts of the world less than one percent of the people own cars and less than twenty percent can afford any form of motor transport, yet they all in some way or another go to education, health care, employment and markets. Even where wealth is not a constraint there is a growing number of examples of people having access without relying on the privilege of affluence - the private automobile which requires fossil fuel<sup>1</sup>.

Like in many other countries, the transport sector in Zimbabwe has expanded rapidly as a result of growth in the economy and hence there has been need for fuel to service this sector and according to a 1985 study by the International Institute for Energy and Human Ecology, ESMAP Report, the transport sector burden on the National Energy Bill is quite heavy. Three quarters of the national oil goes to transport while the imported liquid fuels constitute about 70% of the energy requirements of the transport sector. One school of thought argues that higher energy consumption does not necessarily mean better economic performance<sup>2</sup>. In fact in developing countries such as Zimbabwe, it is not higher energy consumption but rather more expenditure on energy that is seen as a major constraint on economic

development, as it invariably leads to higher inflation rates, lower growth rates, balance of payments deficits, pressure on other forms of fuel such as wool and socio-political instability<sup>3</sup>. Ironically all this is not entirely necessary, alternatives such as electrification of the whole rail network and modernising the aged vehicle fleet may be promoted. The bicycle as a means of personal transport is also one good example. Such a "small technology" however, according to has got to be appropriate in terms of its full range of social costs, benefits and value systems<sup>4</sup>.

The bicycle itself is a very simple machine which does not require fuel for its propulsion. It can easily be mastered, is easy to house and carry, inexpensive to purchase and maintain. The bicycle has with stood the test of time since it was first commercially sold in 1865 by M. Michaux at 29 Avenue Montaigne, Paris at 200 francs (it was not for ordinary citizens then). The bicycle provides recreation and can easily load ten times its own weight. A well looked after bicycle can last a life time<sup>5</sup>.

In recent years a lot of attention has been paid to the bicycle for a number of reasons. Associations have been formed world-wide, for example, Ghana Bike Youths, International Bicycle Fund and the European Cycling Federation to mention but a few. These associations considered cycling as multifunctional in some respects. It has been used a means of touring. Cycling organization chiefly of social character, were established in London in 1970, namely the Pickwick Bicycle Club. The main aim of these clubs was the promotion of cycle touring. Cycling was also viewed as a sporting activity, where in U.S.A. in 1870s, it had become one of the nation's major sport. It had also been used for military purposes in Britain. A close look at how the bicycle is viewed and attitudes to cycling, in both developed and developing countries, shows that there are divergent views. Attitudes and views are closely related to socio-economic of whatever country. For example, in China, workers in factories and farmers in rural settings consider use of bicycles as a convenient form of travelling for both to and from work and transporting their agricultural commodities within short-range distances. Hence there is more production of bicycles and setting up of spare parts factories, because of the rising demand for bicycles of different types. Presently China produce more than 100 kinds of bicycles to cater for all levels of people in society. Production of diversified bicycles, indicates that use of bicycles is now highly valued for its convenience purpose to help reduce traffic jams in bigger cities and for transporting bulky goods. China has 81 bicycle factories which produce 41.4 million bicycles and more than 500 components and spare parts per year<sup>6</sup>.

In view of traffic congestion, primary, middle and high school students in some parts of China such as Beijing, have resorted to use of bicycles for convenient purposes of travelling, travelling to and from school. They also highlighted problems of delays encountered with public transport system, and also admitted the high risk, it entails, of being involved in road accidents. Some students consider cycling as interesting, the best way to keep up with the changes in the city and the fun it provides<sup>6</sup>.

In contrast to China, people in the United States of America have different attitudes towards the use of bicycles. Studies funded by the National Conservation Committee on the feasibility of promotion bicycle transportation as an alternative form of urban passenger transport have gained momentum in U.S.A. However it is said that the situation is far from approaching the degree of acceptability found in other countries such as Netherlands. Adults

in that prefer the use of bicycle because it provides healthful and relaxing exercise, it does not require petroleum-based fuel nor does it pollute and that its accessible and reliable. People in the Netherlands, generally have a positive attitude towards the use of bicycle despite discomforts from extreme weather conditions and possible injury or death from motor vehicular traffic.

Three studies conducted in Minneapolis in 1974 on bicycle usage, revealed that of the 40% of Americans who use the bicycle, only 15% of their trips were for utilitarian purposes. Such utility trips had specific, non-recreational purposes such as shopping, personal business indicative of the case that few cyclists pedal to work. In response to why few people pedal to work, the study pointed out that nearly 50% of all U.S.A. cyclists were under the age of 16 years and secondly that the frequency of bicycle trips or use drop at the age of 16 years in preference to motor car which provides a symbol of adulthood.

In Britain in 1880's, high bicycles or "**ordinary**" known as penny-farthings usually with tangential spokes and hubs containing ball bearing - a highly significant technological break through - became the standard model and formed the focus of attention for bicycles clubs. Then members were mainly middle class city men who generally met once a week to participate in ritualistic rights, interspaced with a range of other activities such as dining, drinking and gambling. Meanwhile tricycles were developed and used for the upper class and the "respectable" professions such as clergymen and doctors.

A decade, later low rear wheel driven bicycles were replacing high wheel bicycles as the standard model. These "safety" bicycles featured adjustable handle bars and seats and spring saddles. More significantly the pneumatic tyre was patented leading to further developments in cycling as competitive sport. After the turn of the century, vast increases in productive efficiency and burgeoning market allowed the cost of bicycles to fall sufficiently to allow working people of modest means to buy one. In Britain, cycling also became associated with socialist movement, with the bicycle seen as the epitome of compassionate and civilised way of life<sup>7</sup>.

Today in Britain cycling is being vigorously promoted as a means of health and fitness. Examination of the these aspects of cycling, perhaps the least researched areas may provide the most compelling reasons for encouraging participation in cycling. There is growing body of evidence that links regular exercise to improved health.

It has been said that the educational system in Greece in classical time included gymnastics, as well as mathematics and music, as essential daily activities and the Romans coined the motto (*mens sana in corpore sano*) - a health mind in a health body. The inclusion of physical activity in the school curriculum was a clear recognition of the link between regular exercise and health. Since then, the association between physical fitness and health has been more closely investigated and the virtues of maintaining fitness in all its manifestations have been almost universally recognised<sup>8</sup>. Unfortunately in Zimbabwe, the fitness and health of the nation is not monitored at all. This is not to say that there are no adults in Zimbabwe who get sufficient exercise to maintain fitness. In fact the country is becoming more mechanised and people are adopting sedentary life-styles. One wonders whether this will not incur some cost to the society.

A study to investigate patterns of bicycle ownership and use in Harare was therefore carried out. During the study it was borne in mind that transport behaviour was based on perceived needs and subjective beliefs of how travel needs could be satisfied. Beliefs and perceived needs can be more or less accurate, they are also subjective to earlier experiences, personal values, the adequacy of information and deep rooted habits. These can influence whether people even consider using bicycles to get around. Besides these individual psychological factors, social factors play a crucial role. The direct social environment, such as family, friends and colleagues and the larger social context mediate information people receive and set norms determining which beliefs and behaviour are proper. This is why the study also involved talking to policy makers to find out more about current central and local government policy on cycling.

## METHODOLOGY

Because of failure to acquire a sampling frame from which to select respondents using probability sampling techniques, a non-probability sampling technique was therefore used. Unstructured interview schedules were used for data collection from the Ministry of Energy and Transport, Department of Works of the City of Harare, bicycle retail shops and a bicycle manufacturing company. Both the purposive and convenience non-probability sampling procedures were used in this study. It was purposive in that selection of 763 respondents was based on knowledge of people who use bicycles such as security guards, messengers, postmen, policemen and school children. Companies selected included those with workers who mainly use bicycles such as Colcom, Post and Tele Communications (P.T.C.), security guard companies. The sample was also convenient where the interviewer chose to interview any first person who satisfied the sampled group of individuals. In all these cases a pretested questionnaire was used. Households, randomly selected, from both the low (middle and upper income bracket) and high, (low income bracket) density areas of Harare were also interviewed.

In an attempt to measure the attitudes of respondents towards the use of bicycles as a means of personal travel, the likert scale was used on 200 school children and 563 other people. This was meant to assess whether they had a positive attitude towards use of bicycle as a means of personal travel.

The questionnaire asked questions related to:

- (1) family income bracket
- (2) distance from school/work place
- (3) method of travel according to journey purpose
- (4) bicycle ownership and use
- (5) members of the household that could ride a bike

An observation of the mode of transport was done on two major and busier routes in both the low and high density areas at peak hours of the day. The sole objective was to assess the frequency of bicycles being used as compared to other modes of transport. Cyclists, were stopped randomly and asked questions related to:

- (1) advantages and disadvantages of cycling
- (2) knowledge about the bicycle and its maintenance
- (3) deterrents to cycling

A content analysis of Government official statistics on road accidents involving cyclists was done to look at the aspect of safety.

## RESULTS

### Transport Sector and Energy Policy

Most of the information in this section was acquired from the analysis of documents and reports in the Department of Energy and the Department of Transport. An interview was also held with the Deputy Director responsible for policy in the Department of Energy. The Deputy Director conceded that Zimbabwe up to now does not have an Energy Policy, but rather the policy was being prepared. Currently the country is using findings from various studies carried out by various institutions as a way of assisting the country in managing its Energy Resources. These findings are forming the foundation for the policy. The Institute for Energy and Human Ecology through their Energy Management Assistance Programmes carried studies for the country in 1982, 1985 and 1992.

According to the 1985 study "*Policy Options for Energy Development in Zimbabwe*", Zimbabwe is not self-sufficient in terms of its energy needs. Its Transport Sector relies heavily on Imported Liquid Fuels with the most common mode of transport, like road motor transport entirely depending in Imported Liquid Fuels with some blending with locally available ethanol. Transport alone accounts for 10% of the National Energy Bill. But for the Imported Liquid Fuels, transport accounts for 75% of the total. The situation has been like that in the last ten or so years.

The 1992 ESMAP study found out that the high fuel consumption by the Transport Sector does not mean that the country has a well serviced and efficient transport system. Instead the transport sector of the country was seen to have very low levels of efficiency and this low efficiency level was attributed to the following factors:

- i) The composition of the vehicle fleet of which 75% is at least 10 years old and out modeled;
- ii) Lack of measuring and control equipment of spare parts leading to below standard maintenance of vehicles;
- iii) Lack of adequate training in vehicle maintenance and in energy efficient driving and also the absence of a National Transport Masterplan;

As a result of this about 25% to 30% of all Imported Liquid Fuels goes to Road Motor Transport alone.

The study went on to recommend that:-

- a) There should be an overall 100% increase in efficiency of petrol driven vehicles by the year 2002.



- b) Electrification of at least half of the rail system - this would realise about Z\$14 million in foreign savings;
- c) The country should have an Integrated Energy Plan which considers every aspect of the economy and the substitution where possible of Imported Fuels with locally available energy resources.

The SIDA Sponsored National Transport Study of 1985 laments the over dependency of the country on Imported Liquid Fuels. In addition it would appear that in Zimbabwe the traffic has not more milage per hour of lifetime for the majority, but more hours of consumption of high doses of energy, packaged and unequally distributed by the transport industry.

The study reported that in 1983 about 700 000 tonnes of oil was imputes at cost of Z\$200 million representing about 20% of all imports to the country. The study views this as a weak link in the economy and that the situation is made worse by what it terms "major uncertainties in the Middle East Oil Market". Some of these uncertainties were viewed as:-

- i) The volatile political situation
- ii) The ability of OPEC to control prices

They report went to on to suggest ways of reducing this dependency by focusing attention on those energy resources that are available locally.

- a) Gasification Synthesis of Coal like the (SASOL Plant in South Africa);
- b) Direct Liquification of coal;
- c) Methanol from coal either to mix with petrol directly or for conversion into petrol via the so called "M.T.G." process.

The study however, conceded that all these alternatives are quite ambitious and that they would need great amounts of technological investment, research and the political will to succeed. For example a rough estimate for a SASOL type of plant (for the gasification and synthesis of coal) to replace all oil imports indicates an investment of around \$1800 million (twice that of Hwange Power Station) which would require a price increase of 18 cents a litre of both petrol and diesel to be self-financing.

The National Transport Survey suggested the following as a basis for an Integrated Transport Policy:

- i) The promotion of Economic Efficiency
- ii) Consideration for equity and rural development
- iii) Appropriate use of Government control
- iv) Development of Human Resources

- v) Promotion of Energy Conservation
- vi) Promotion of regional co-operation

### Local Government Policy on Cycling

An interview was held with an official in the Traffic Planning Section of the City's Works Department and the officer revealed that cycling was very much neglected at policy and planning level as could be evidenced by the lack of infrastructural backing within the city. For example one could see, as shown in Fig.1, the "few" cycle tracks along major routes leading to Industrial sites for use by workers.

Fig.1: A major road leading into an industrial area in Harare.



This system was designed during the colonial era and is very much in place today but somehow neglected. The interview also revealed that the city centre roads and pavements were designed with motor vehicles and pedestrians in mind and it was already too late to modify them to accommodate pedal cyclists as most roads had reached their maximum width capacity (Fig 2).

**Fig.2: A major road in Harare city centre.**



Despite the lack of meaningful support services, the City Fathers still required bicycle owners to licence their machines at \$1,60 per annum and as of 1992 the number of registered bicycles stood at around 29 500. The officer interviewed conceded that there was a very negative attitude towards cycling and that it was associated with low levels of living and at council planning level it was considered as low priority. An interview with the Deputy Director of the Zimbabwe Traffic Safety Board (ZTSB) on the safety of cyclists, revealed that Z.T.S.B's view towards cycling was guided by the provisions of the Highway Code and the Road Traffic Act, both of which recognised pedal cyclists as legitimate road users and liable to prosecution in the event of breaching any prescribed rules of the road. He did admit that with the economic hardships more and more people were resorting to cycling. The Board thus had prepared elaborate training programmes aimed at enhancing the safety of cyclists on the road with or without cycle tracks. The Board was now paying visits to schools and other work places with a considerable number of cyclists to inspect the state of the bicycles with the help of a detailed form and stickers in red, yellow and green depicting the state of the bicycle. The Board also conducted training sessions at its Mt Pleasant Traffic Training Centre, in the City of Harare, for both children, adults and any interested people free of charge. Unfortunately ZTSB is not a legal entity, it only works in an advisory capacity in conjunction with police and V.I.D. (see forms attached on Training and Cycle Inspection).

Discussions with the Police Traffic Liaison Officer revealed that all was not well despite what ZTSB was doing. Accidents involving cyclists continue to happen. The police traffic liaison officer seemed to blame the cyclists (Fig.3).

Fig.3:

The Herald

## Cyclists to blame for most accidents

**Herald Reporter**  
ZIMBABWE has an average of 200 road accidents involving cyclists and about 40 percent of the cyclists are to blame, the officer commanding police (traffic training), Superintendent Martin Simbi, said in Harare yesterday.

In a statement on the eve of the road safety campaign week which starts today and ends on Friday, Superintendent Simbi urged cyclists to use cycle tracks where they are provided. He also appealed to city authorities throughout the country to increase cycle tracks.

The theme of this week's campaign, being held in conjunction with the Zimbabwe Traffic Safety Board, is cyclists, and police throughout the country will be distributing relevant literature on road safety.

The campaign will be addressing issues such as the roadworthiness of cycles. The cycle should have efficient brakes, good tyres, reflectors and a bright light able to illuminate the road ahead for not less than three metres and not more than 30 metres.

Superintendent Simbi expressed concern at the increasing rate of drunken cycling: "We have charged them and we will continue to charge drunken cyclists," he said.

He called on cyclists to take advantage of facilities offered by ZTSB cycling centres in Harare, Bulawayo, Gweru, Mutare and Masvingo.

As can be seen from the article issues raised relate to:

- 1) Cycle tracks
- 2) Bicycle condition
- 3) Bicycle safety equipment

## Cycle ownership, use and attitudes

Interviews with two major bicycle retailers echoed the manufacturer's claims that the local bicycle market was quite healthy and that the retailers were able to supply all orders sent to them by customers. The supply of cycle spare parts had not been as bad as that in the Motor Trade Industry. However, what was interesting to note was that bicycles bought from most of these shops, were mainly for school children, and for workers in the commercial sector.

Officials from one of the organisations that had introduced bicycles loan schemes to their employee revealed in an interview that the company had been prompted by the transport shortage around 1990 and the resultant absenteeism. The scheme was launched after consultation with the workforce at the company. It became so popular that it also included the middle management. Bicycles were then bought with a mark up of 10% to cover for the administration costs. It was reported that since the introduction of the scheme absenteeism had been greatly reduced and that some people were now cycling for 32 km and still got to work on time. The company had sent all its cycling employees, about 300 in number for training by Z.T.S.B. As a result none of workers who commute by bike has been involved in an accident.

The City of Harare, Municipal Police had a similar scheme, the Bicycle Purchase Assistance Scheme which had been introduced after it was recognised that the bicycle offered a cheap form of transport. Originally the Council used to buy bicycles that would be stationed at various centres, ie cycle parks and any member of the Municipal police would use these while on duty. In other words, these bicycles were not to be taken home. What was amazing was that the force discouraged its members from using bicycles in town as they saw it as very dangerous. They have never sent any of their members to the Zimbabwe Traffic Training Board for the training.

The availability of such a loan schemes in the commercial sector, showed how committed some employers were towards the need to cater for transport to their workers. They realised that it was a cheaper and reliable means of transport low-income workers could afford. At the heart of this scheme, was also the need to help reduce the hours lost in looking for public transport to and from work.

Interviews with school children and general observation at different schools showed that bicycles were not used as would be expected considering the number of kiddie tricycles that were bought from the cycle shops. The study showed that many adults could ride bikes but did not own one. More men about 90% could ride as compared to 30% of the women interviewed.

Demographic characteristics of the people interviewed are shown below.

## SEX DISTRIBUTION (%)

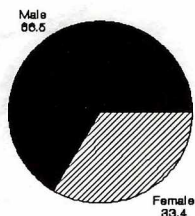


Fig.4

## AGE DISTRIBUTION

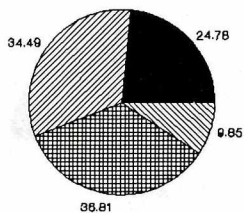


Fig.5

Years	Percent
05-13	24.78
14-18	34.49
19-41	36.81
41+	9.85

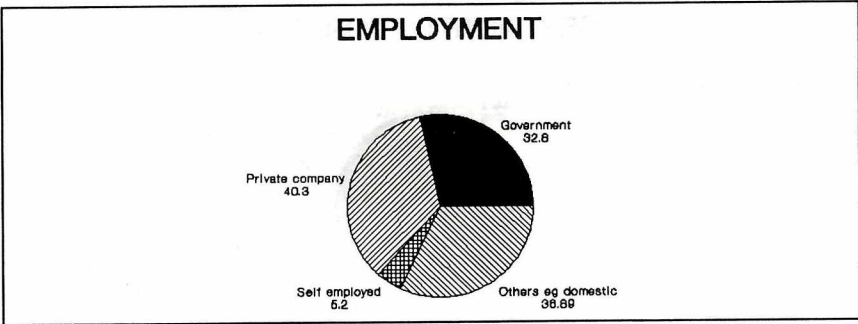


Fig.6

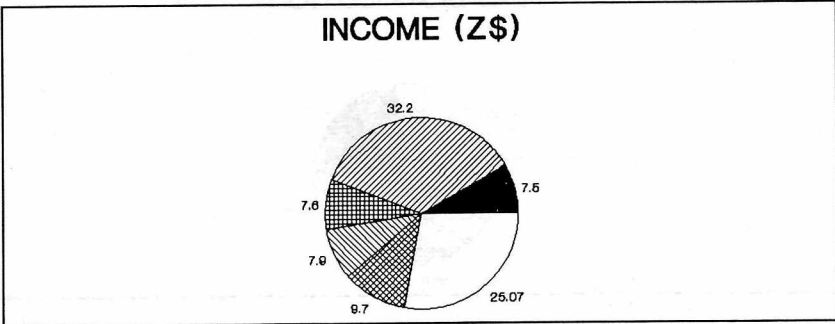
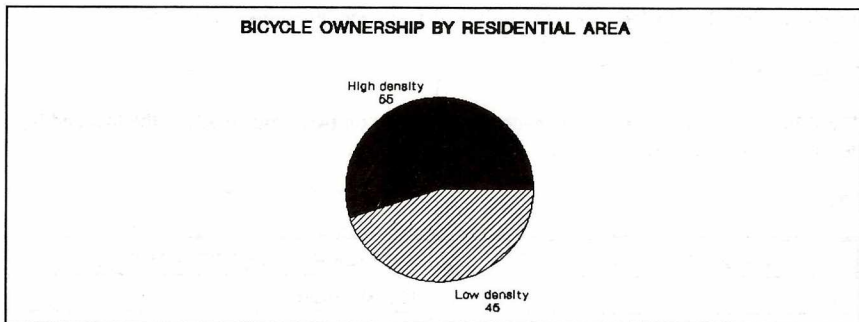


Fig.7

Z\$	Percent
0.00	25
050-250	7.53
251-500	3.2
501-750	7.68
751-1000	7.97
100+	9.7



**Fig.8**

The age range of respondents who were considered to be the main users of the bicycles in both low and high-density residential areas was 19 to 44 years. In low-density areas, most areas bicycle users were children and teenagers. About 1 in 8 of children in the same age range living in the high density suburb used the bike. More adults, almost 99% males, between the ages of 24 and 44 years in high density areas of the city were regular cyclists as compared to 8% of those living in the low density areas.

The results showed that the bicycle use was more popular among young boys and girls living in the low density, because the household in these areas had disposal income. Car ownership was therefore high in the low density in the areas of the city, hence few adults commuter-cyclists. The figure below shows bicycles ownership by residential area.

Not all households reported to possess a bicycle. However nearly 100% of all respondents in the high density areas concurred that cycling was a cheaper means of transport meant to alleviate transport crisis. Some potential cyclists in certain households indicated the interest they had in cycling for both health and recreation, in addition to its reliability and ease to use.

An interview with a top official of leading Cycle Manufacturing Group revealed that locally manufactured bicycles were regarded as high quality cycles. A subsidiary of the group which was directly involved in the manufacture of bicycles had actually recorded a profit and this was attributed to quality of products and a healthy local and external market, despite the proliferation of externally manufactured bicycles. Most of the materials used for bicycle manufacture were locally available, hence prices could be expected to be quite reasonable. A snap survey and interviews with cycle shops owners showed that all types of bicycles were now generally available in Harare.

The prices of imported bicycles were quite high. This was due to the cost of importation and the fancy decorations. This was not, however, regarded as a reflection of their quality and performance over the locally manufactured bicycles. The prices of bicycle varied from one shop to the other. In one shop the prices were from \$900 to 5000 and in another it was \$620 to 2500. From this observation it would appear that the two shops catered for two



different clientele. In fact one shop only had fancy mountain bikes and racers.

### Modes of transport

The following were observations made at peak hours on two major roads in the low and high density areas of the city.

TIME: 07:30 AM TO 08:30 AM

MODE OF TRANSPORT	AVERAGE N°. PER EVERY 30 MINS
Bicycles	12 (100% single riders)
Pvt cars/Pvt Staff Buses	507 (75% ½ full)
Public buses/Mini buses Z.U.P.C.O	7 (50%) full
Emergency Taxis	18 (100% full)
Hired Taxis	5 (100% ½ full)

Fig.9: Traffic congestion in Harare in the morning.



TIME: 16:40 PM TO 18:30 PM

MODE OF TRANSPORT	AVERAGE N°. PER EVERY 30 MINS
Bicycles	39 (100% single riders)
Pvt buses/Pvt Staff Buses	535 (75% ½ full)
Public buses/Mini buses Z.U.P.C.O	7 (50% full)
Emergency Taxis	30 (100% full)
Hired Taxis	8 (99% ½ full)

Fig.10: Traffic congestion in the evening in Harare.



An estimate of pedestrians during this times was 50 per every 30 minutes. The most frequent mode of transport, the private vehicles were seen to be carrying less than their capacity and public buses were not being fully utilized ie they were not full. It would appear that emergency taxis were popular even though passengers travelled squashed. All cyclists observed on these roads appeared to be mainly males and were between the ages of 25 and 54 years with at least primary education. The cyclists were stopped at random and asked a few questions. They all belonged to the \$250 - 500 per month income bracket. Asked why they choose the bicycle as a means of transport, about 90% of them cited several reasons. The main ones were that cycling was cheap and convenient. Some of the cyclists, mainly security company workers indicated that they had acquired a bicycle before looking for a job. In fact, it was later found out that most security companies required a potential employee to own a bike.

About 70% of cyclists mentioned that for longer trips, ie 6 km and more, they would prefer to use other methods as shown in Table 1.

**Table 1.** Proportion of journeys by cycle and all travel methods according to distance-band(%)

	Distance band (km)			
	0-5 km	6-10 km	11-20 km	21+ km
Cycle	33.12	30	0.15	-
WALK	33.12	0.15	-	-
PUBLIC	24.41	54.85	85	90
TRANSPORT*	0.15	15	14.85	10
PRIVATE				

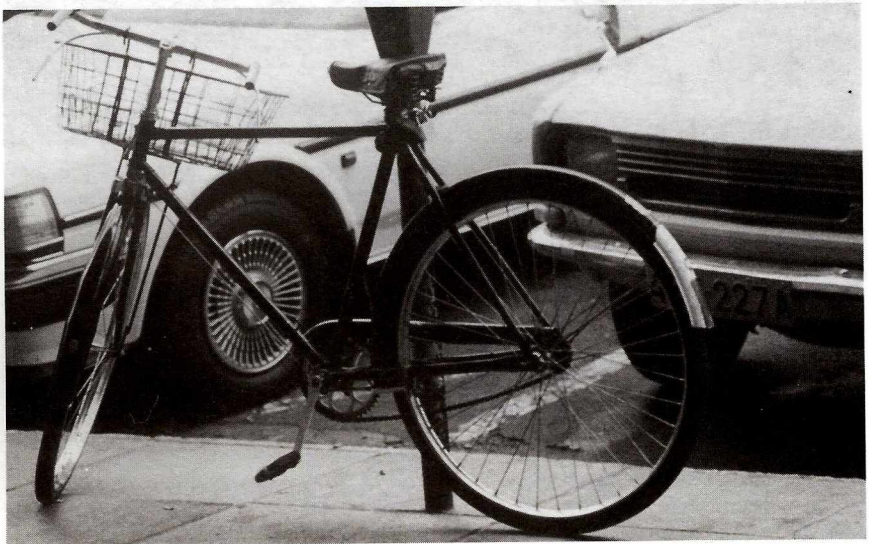
\*Public transport denotes emergency taxis, Public Omnibuses etc.

The major deterrents to cycling cited by frequent cyclists, particularly messengers, postmen and security guards were:

- \* attitudes of motorists
- \* lack of cycle tracks
- \* hot weather and effort involved in cycling

In connection with the issue of effort, the cyclists were asked what they knew about gears, and the weight of bicycles. It appeared most of them had very little knowledge about bicycle technology. The type of an ordinary bike seen on the road in Harare is shown in Fig.11.

**Fig.11:** A typical ordinary bicycle seen in Harare.



Almost 50% of the bicycles which were examined were in good condition as shown in Table 2. However most of the cyclists and even potential cyclists indicated that there were some advantages and disadvantages of cycling as shown in Table 3. These included fitness and health ie general well being, and reduction of environmental pollution. A few 5% complained about some problems associated with cycling. These were difficult in passing urine, appearance of nodules and small lumps on the buttocks and occasional pain in the whole arm or hand.

**Table 2. Bicycle type and condition**

		% TOTAL
Bicycle type	Ordinary	78
	Racing	20
	Tandem	-
	Tricycle	2
Condition of bicycle	Good	48.43
	Satisfactory	47.39
	Bad	4.18

*Good = tyres relatively new, bell, brakes still working ie well maintained bike*

**Table 3. Advantages and disadvantages of cycling**

		% Total
Frequency of use	Everyday	82.86
	Once a week	10.43
	When necessary	8
Advantage	Cheap	64.35
	Low congestion	11.07
	Fitness and health	24.56
	Low pollution	0
Disadvantages	Motorists*	75.23
	No cycle tracks	13.33
	Theft	11.46

*\* Motorists = attitudes of motorists on the road.*

### **Road Accidents involving cyclists**

An assessment of Government statistics on road accidents involving cyclists was done through the Central Police's Traffic Section in Harare.

Statistics obtained from the police's record book of accidents showed that the total number of cyclists injured in the previous year of 1992 in Central Harare only was 133, while that of cyclists killed in road accidents was 13. According to the interviewed police officer within the traffic section, the above figure was a true reflection of cyclists killed on the spot, as reported. The figure was conservative, since road traffic accidents involving cyclists were not always reported or recorded. However, the police's traffic section considered lack

of cycle tracks in most parts of the district as one of the major problem. It was in portions of major roads that cyclists had fallen victims, as most motorists did not look or take precautions to safe guard cyclists' safety.

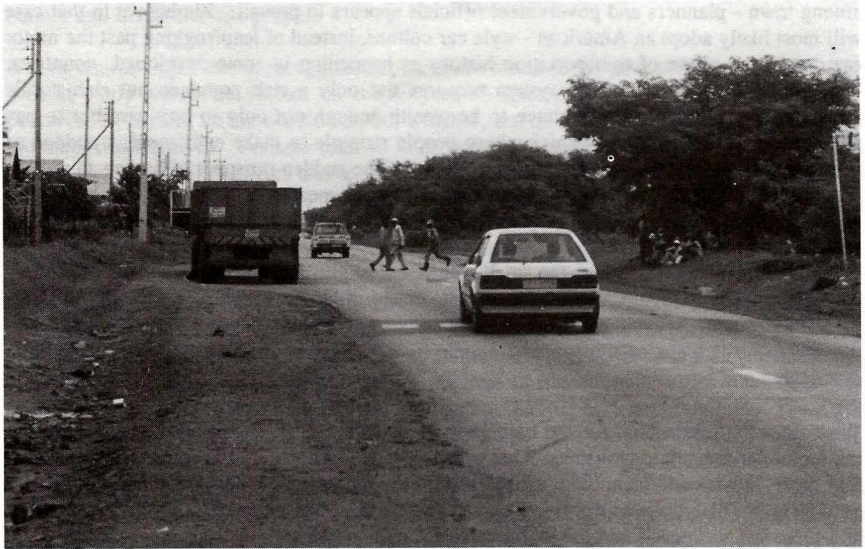
## DISCUSSION

It has been suggested that, in future, the most successful city or town planners, will be those who see the movement of people and goods as part of a larger process, in which a personal transport vehicle is not part of an occupying army of aggressive commuters but an efficient non-intrusive participant in community life. The transport planners will also be those who will introduce transport policy with a health dimension.

In a description of its "health promoting strategy" which is aimed at looking at the health issue with environmental and ecological issues the World Health Organisation highlights the range of government portfolios involved in promoting equity and health but transport is not included, suggesting that the consequences for health resulting from the use of different forms of transport are not being given the consideration they merit<sup>9</sup>. It was also clear from the analysis of local and central government documents that current transport policy were deficient in terms of recognition of its health dimension and the breadth of its social context. A major explanation for this, is that there has been no prioritisation of transport modes in terms of their social an environmental impacts in use. Anyone given the task of devising a strategy aimed at promoting patterns of travel which are conducive to health would have to conclude that cycling is the transport mode deserving the highest priority. However, current policy is focused on catering for, if not positively encouraging, the adoption of motor-based lifestyles requiring increased ownership and use of motor vehicles, which are generally preducial to public health. This has been formulated in the belief that the resultant increase in traffic and expansion of the road network are indicators of progress and higher standards of living. This could be seen from the number of roads and the way they are being constructed and maintained in and around Harare. These roads are clogged at peak hours. This has obviously created a situation which might make it easier for authority to ban the bicycle from these roads altogether.

When making any useful comments on the overall transport policy in Harare, if it exists at all, one must make reference to traffic calming which is typified by humps on certain roads in the city, as can be seen in Fig.12.

**Fig.12: The traffic calming concept in Harare (humps can easily be avoided!)**



However traffic calming should be understood in a wider and not in a more restrictive sense. In a wider sense its definition includes, apart from a reduction of the average motor vehicle speed in built up areas a strong promotion of pedestrian, public and bicycle transport. The concept is wrongly understood because it appears it is being applied purely as road traffic engineering policy. What has happened is that the number of motor vehicles or the average motor vehicle speed on the streets which have been treated has been reduced, but traffic had redistributed itself into other neighbouring streets. Speed limits in the city of Harare on these streets is scarcely observed even by the police, few drivers actively oppose it. One would have thought enforcement of speed limit would be the most efficient economic measure to curb fuel crisis. Oil prices surely should influence speed limit in a country like Zimbabwe.

Many cycle tracks in and around the city of Harare are now so ill-repaired as to be unusable. This is hardly surprising cycle tracks, as indicated by the officer from the Roads Department, are a low priority so far as maintenance is concerned. What is not realised is that even a bad road surface is a great danger to the cyclist than it is to the car driver. People are known to fall off their bike on uneven surface, resulting in major injuries.

As a matter of fact car numbers are on the increase on Harare streets. It would appear that sales of cars - all powered by internal combustion engines - has been rising steadily. If the trend continues, especially after the economy picks up, cars will take over as the number one choice of personal transportation as seen in the results from the street observation at peak hours. It should be borne in mind, however, that the majority of people in Zimbabwe do not now have the optional use of a car. Nor can they in the future because they can never fulfil

the pre-requisites for driving their own car of being old enough to do so, having adequate income, and having sufficient confidence to drive. In fact, the opposite kind of thinking among town - planners and government officials appears to prevail. Zimbabwe in that case will most likely adopt an American - style car culture, instead of leapfrogging past the motor car dominated phase of transportation history as happening in some developed countries. The American-style motor car system requires not only a rich populace but rich public treasury - meaning the citizens have to be wealthy enough not only to buy cars but to pay heavy taxes as well. In economies where people struggle to make ends meet, a sudden or unanticipated increase in motor insurance costs, of the sudden prospect of having to replace a crumbled mud guard, or the unexpected news from a mechanic that the timing belt needs replacing at a cost of several hundred dollars - on top of the out - of pocket costs of car payments and gas - can add up not just to a financial burden but to an emotional one as well. To this can be added the noise, the smell, the visual blight, and the worries about depending on a fuel that must be protected by constant, costly military vigilance in a highly unstable part of the world. Many developed countries such as, the Netherlands and Switzerland, are moving towards ways of transporting people in ways less luxurious but more ecologically sustainable and humane.

What does the future hold for the bicycle in Zimbabwe. First an appropriate balance with the motor car must be established. That prospect may seem to defy the conventional wisdom that more "advanced" technologies usually replace simpler ones, and are synonymous with "progress". This idea is so deeply ingrained that we easily assume that the bicycle came first and then was succeeded and gradually replaced by the technologically superior automobile. But in fact, the sprocket chain-driven bicycle and gas - driven car were both invented in the same year - 1885. The two technologies as we know them today developed side by side.

Until the wholesale manufacture of **Safety**, the bicycle, those who rode bicycles were defined in the first phase by the mechanical ingenuity and afterwards, in later phases, by their desire for speed and their athletic ability. For the first few years of the cycling boom the bicycle's predominant role was still as an instrument of leisure. This would appear to be the case with our policy makers in Zimbabwe, where the attitude is that the bicycle is real for creation/tourism/sport rather than more obviously as a means of personal travel. No civil servant in the Department of transport deals with cycling, even on a part time basis. Cost-benefit analysis is not applied in the context of provision for cycling as an alternative to road building, to accommodate more traffic even though there would appear to be a prima facie case for believing that the unit cost for providing for a bicycle kilometre is less than that for a car kilometre. One can really speculate why things are the way are in Harare, that the reason for the non-seriousness about cycling among policy makers is, it would be inadvisable to encourage people to adopt cycling as a means of travel because of the relative danger in current traffic conditions.

## **Deterrents**

Transport behaviour is based on perceived needs and subjective beliefs of how travel needs can be satisfied. Although beliefs and perceived needs can be more or less accurate, they are also subject to earlier experiences, personal values, the adequacy of information, and deeply rooted habits, and these can influence whether people even consider using bicycles to get around. Besides these individual psychological factors, social factors play a crucial

role. The direct social environment, such as family, friends, and colleagues, and the larger social context mediate the information people receive and set norms determining which beliefs and behaviour are proper.

It is of course important to recognise that there are limits to the attractions of cycling. The present study and other studies on the subject of deterrents have found that the danger perceived in current traffic conditions, hot weather, traffic fumes and motorists attitudes are the main disincentives. Perhaps the two most pervasive deterrents in Harare to cycling is the growing availability of cars and concomitantly, public attitude (as was seen from the local and central government policy) to cyclists as "second class road users compared with motorists. One hopes that this will change one day as people recognise the unsustainability of traffic growth and its adverse impact.

Fear of bicycle theft never really featured as a deterrent to cycling. Although figures obtained from the police records on this, show that it should be a concern. In fact quite a number of bicycle theft are never reported to the police. This is because even if there were, reported thefts are never recovered. Thefts continue to rise and this is going to discourage people from cycling, especially if there is insufficient security at their destination. There are no cycle parks in Harare and cycle insurance is never promoted by the major insurance companies.

People may be deterred from using the bicycle to work due to inadequate facilities at work place. This is particularly important for potential women commuter cyclists. Basic resources such as showers and changing rooms as well as storage space for work clothes would encourage some people to cycle. The amenities would not have large cost implications for the employer and as well as improving the lot of the working cyclist, they could prove beneficial to the company through improved health and fitness of the work force. Absenteeism has been reduced at some companies as was seen from the results. This agrees with what has been reported in some countries cycling to work has been vigorously promoted. Change of attitude toward cycling in the commercial has to be encouraged.

The other reason that people gave for not cycling was the fear of accidents. This was justified to a large extent due to the growth and speed of traffic on many roads in Harare which has made the cycling environment increasingly unsafe. A recent study carried out on road traffic accidents showed that 12, 21 and 30% (in other roads 43%) were due to vehicle deficiency, speed and motorist negligence respectively<sup>10</sup>. Unfortunately the study did not look at accidents involving cyclists. What this means is that accidents statistics because of varying definition of injury severity are not always accurate because of under reporting particularly of cycle accidents. There is higher risk per mile travelled by cycle rather than by motorised transport. In other words cyclist are more times at risk of injury per kilometre travelled than car drivers and some times as much risk per hour of "exposure". The present study showed that about 5% cyclists had sustained injuries, ie bruises, sprains etc, while cycling. Few of these were inexperienced road users who constituted a disproportionate number of cyclists whose bikes were in good conditions.

The results of study clearly demonstrated that cycling was identified as having a primary role attaining four main objectives for the development of a healthy transport system. These were



- i) to have access to facilities and people to meet social and economic needs;
- ii) to encourage journeys to be made by those modes which were least damaging to public health;
- iii) to minimize the health - damaging consequences of each mode of travel and
- iv) to minimize damage to the environment.

This was in agreement with results carried out by others who have examined in-depth transport as a public-health issue. The responsibility of this important issue should not lie with one ministry. It is clear that all ministries should recognise the mutually supportive role that cycling could play if their policies were co-ordinated with the objective of promoting cycling as a means of travel; as a means of health promotion; as means of conserving fossil fuels; and as a means of reducing carbon dioxide and other damaging gaseous emissions from motor vehicles.

### **Current patterns of cycle use**

The results clearly demonstrated, also, that cycle ownership and use played a significantly lower part in the overall pattern of travel in the city. Very little travel mileage by mechanised modes was being made by bicycle. It was observed that both mileage per cycle and cycle trips per week were very low in both low and high income groups. A close analysis, however, of the results showed that in spite of the deteriorating road environment for cycling, both the number of cycle-owning and multi-cycle household seemed to be growing. Much evidence of the potential for cycling was obtained from a variety of sources. The National Transport Study of 1985 revealed that there was no official statistics on the number of bicycles or extent of their use nationally. But according to a study done earlier by Probe Market Research in 1984, among 1040 respondents in communal areas, high and low density suburbs of major cities in Zimbabwe, there were more bikes in the low density areas. This was followed by communal areas. This to some extent is what was reported about cycle ownership in England, where cycle ownership was found to increase as areas became less urbanised<sup>11</sup>. There were at that time between 350,000 and 425,000 bicycles in Zimbabwe. The present study has shown that about 8 in 10 male adults could ride a bicycle. But unfortunately few owned a bike. This figure is lower in female adults, about 4 in 10 women seemed to be more timid about cycling, stressing the effort and discomfort associated with cycling. Several reasons have been cited for this. One other reason mentioned by most women was that culturally the bicycle has always been daddy's property, accessible only to boys and hence many males in Harare could ride a bike.

It was shown from the study that a lot of parents do buy bicycles for their children but did not encourage them to take on cycling seriously in adult life. Recent surveys in schools in different areas of England has recorded the ownership of cycles among junior school children at 90% but only 1% use them to travel to school<sup>12</sup>. From the interview with school children it was seen that the ambition of most of them was to own bicycle and unfortunately for the larger majority this was unfulfilled. If their ambition were to be fulfilled it might therefore be supposed that the children would become accustomed to using a bicycle as transport and this view of the uses of bicycle would pervade their later life. Cycling was associated with a pleasurable part of childhood. From a psychological rather than a social viewpoint,

attitudes are rooted in experiences of childhood. Some school children interviewed regarded cycling as a way of developing practical skills and techniques, and achieving status as well as a means of transport enabling them to be the less dependent on parents. It was not a family activity. It was learnt from some of them that they felt a sense of achievement in travelling with their own energy and being in total control. Others considered it stylish to be cyclists and suspected that even though non-cyclists might regard them as eccentric, they were in some way admired. The benefits of cycling were seen in terms of saving money, exercise and convenience. A few people mentioned environmental benefits - less noise and danger through cycling rather than driving.

### **Pollution of the environment**

The great majority of exhaust pipes of many cars are on the left side at the rear of the vehicle. This is in the direction closest to where most cyclists are riding. Because of the effects of air pollution on fauna and flora, from industrial sources, the impacts on human health from all sources including vehicle immersions have been examined. A study carried out on major roads in Harare has shown that Pb levels in soil and vegetation to be 1480 and 23.3 mcg/gm respectively<sup>13</sup>. The study has recommended the gradual phasing out of the level of Pb in the petrol used in Zimbabwe. This is relevant to cycling because the physical exertion entailed requires deeper breathing. The present study did show that some of the regular bicycle commuters and indeed potential cyclists were aware of the environmental pollution caused by motor car emissions. Potential commuters voiced an objection to cycling because of fear of breathing polluted air which may have adverse effects on their health. They overlooked the question of pollution by noise associated with many stress - and hearing related health effects, which lowers the quality of the cycle environment<sup>14</sup>. The increase in motorised traffic in Harare has also led to more noise and pollution but unfortunately there are no national surveys and air quality is infrequently monitored. Those who say they would cycle if it were not for the number of cars and pollution, should take part and try it. Then they will be less traffic.

**Fig.13: Shows pollution caused by emission from exhaust pipes on the right hand side.**



*Similar amounts of exhaust would be emitted by vehicles with pipes on the left*

### **Health and fitness benefits of cycling**

Among the common physical activities, cycling comes nearest to an ideal form of exercise. It involves the rhythmic contraction and relaxation of large limb muscles - ideal aerobic exercise. Cycling of course, utilises the large limb muscles, including those of the trunk. One would not expect cyclist to have problems with low back pain. Unfortunately this was not the case with some of the cyclists interviewed. About 2% of cyclists did complain of low back pain in addition to having nodules or small lumps on their buttocks and occasional pain in the arm or hand. Some of the problems could be associated to the condition of the bike. For example the most bikes saddles were not level with top of the handle bars which was the most comfortable position when riding a bicycle. Few cyclists had an idea about and pedal resistance and weight of the bicycle whose technology has improved over the years to make it possible to ride without difficulty. Even when carrying a heavy load as seen in fig 14 below.

Fig.14: Easy rider



The present study had shown that people in general, were aware of the health benefits of cycling. The gentlest cycling, entailing on energy expenditure of 4 or 4.5 calories per minute, will be more strenuous than is customary for a sedentary adult population: it will be worthwhile "overload" in the jargon<sup>15</sup>. The aerobic overload induces a training effect, so improving mental health, physical fitness with its multiple cardiovascular and other adaptations, improving the capacity for physical work and movement, and endurance, stamina. Cycling has built-in rest periods between its submaximal rhythms which make long spells easier and reduces aerobic elements, fatigue and lactic acid accumulation: Another feature of cycling is that the body is partially supported, avoiding local fatigue and excess, static loads on joints muscles and tendons - so important for the over weight.

## CONCLUSIONS

1. From the discussions with people in the Departments of Energy and Transport, it would appear that, indeed, Zimbabwe does not have an energy policy.
2. There is no comprehensive transport policy in Zimbabwe due to compartmentalisation of areas of responsibility of government departments with the consequence of oversight or lack of insight all too easily occurring. The central government and the City Council of Harare both do not see how cycling as a means of personal travel is an essential element in the pursuit of the goal of reducing demand for fossil fuels. A critical factor influencing perception of the significance of government role in promoting cycling is therefore, that the organisation of government departments does not lend itself to take advantage of the mutually supportive and synergistic role that cycling could play in pursuit of their individual policy objective.
3. It would appear that the number of cycle-owning households is growing in spite of the largely deteriorating environment for cycling. The principal source of evidence on cycle ownership was that provided by the only bicycle manufacture and cycle shops. The main use of cycles is for educational journeys by school children and utilitarian purposes ie, post delivery and errands.
4. There were concerns about the consequences of using the bicycle as a form of transport rather than as an item of recreational equipment. Responses to attitudinal survey about cycling indicated that the principal factor deterring people from cycling were exposure to traffic fumes, dislike of the physical effort required in cycling, lack of cycle parks, cycle theft, social attitude, the risk of accidents associated with too many cars on the road and carefree motorists.
5. Cycle accidents are not uncommon in Harare because of the growth in volume and speed of traffic. The main source of road accidents data in Harare is the information collected by the police in their reports of accidents involving death or injury. The study showed that the figures were most likely to underestimate the true level of cycling accidents and as such were somewhat unreliable.
6. In general, among regular cyclists (commuter cyclists) and potential cyclists the perception was that there was a great value in cycling, over and above all the pleasure in it and the good aerobic exercise.

The major outstanding and poorly recognised justification for promoting cycling is its benefits to health, but at present this would be difficult to monitor. The net benefits of cycling as an effective, accessible form of exercise and as a means of personal travel should therefore be promoted vigorously by government agencies, policy-makers, health authorities, local authorities, voluntary groups in a collective and individual capacity.

## RECOMMENDATIONS

### Harare City Council, HCC.

*Measures should be taken to reduce motor-vehicle speeds in urban areas*

If road traffic accidents, RTAs, involving other vulnerable road users, due to speeding, are going to be reduced from 21%, effective measures should be taken to reduce speed. In Harare some of these measures have already been taken in some areas as already shown in Fig.12.

However more should be done and at the same time bearing in mind that whatever measures taken, they should not discourage cyclists from those areas.

*Cycle networks should be introduced to provide safer cycling conditions in urban areas*

The City Council should introduce properly maintained cycle networks in the city not what is shown in Fig. 15. The cycle networks to be developed should include cycle leisure routes which avoid dangerous junctions. Once this is in place, it should then be followed by a publicity campaign. The publicity should stress the strong health, economic and environmental advantages of cycling. This is only possible if the council has cycling officers who will be involved at very stage of the planning process for roads and transport routes. The officers will be responsible for carrying out safety-audits to highlight any problem that may arise from junctions such the shown in fig.16 or crossing in the network.

Fig.15: A typical junction which discourages cyclists.



Fig.16: A poorly maintained cycle track with no lights.



One of the deterrents to cycling is the lack of secure public spaces in which cycles could be parked. Cycle parks are considerably more economical of space than equivalent provision for motor vehicles should be provided at bus stations.

In addition the major obstacle in implementing a viable transportation system in the city of Harare is that the urban planning decisions makers who are usually the in or near the economic class that can afford cars and are more insulated than other socio-economic groups from many of the most negative consequences of the present system. That therefore needs to be done is to:-

- \* Implement policies to increase utilization of existing infrastructure i.e. convert use to only high-occupancy vehicles such as bicycles, motorcycles, carpools, vanpools, buses.
- \* Design any new infrastructure that is necessary to primarily serve sustainable systems.
- \* Develop an official program to raise the awareness, respect and status of environmentally - friendly travel.
- \* Create a bicycle - and pedestrian - friendly infrastructure.
- \* Limit urban parking, particularly long-term.
- \* Institute traffic calming.
- \* Adopt and enforce vehicle emissions standards.
- \* Encourage an ethic that, when at all practical, all trips of less than 6 km (3 miles) are by non-motorized modes.
- \* Revise zoning or land use codes to permit appropriate mixed-use development which reduce trip volumes and distances.

## **ZTSB, HCC and Bicycle Manufacturers**

ZTSB, HCC and bicycle manufacturers should organise classes at regular intervals to provide cycle repair assistance and maintenance advice. This should be included in the road-safety awareness training. Cyclists should also be encouraged to have their bicycles stamped for easy identification

Manufacturers should set up a mechanism through which people can report faults and failures of their bicycle. This has been achieved in the car industry - car manufacturers are increasingly assuming responsibility for the safety and welfare of drivers and passengers. Cycle manufacturers should not be left wanting. A lot of bicycles in Harare are sold without handbooks. Manufacturers could help in producing clear and attractive handbooks to be issued each time a bicycle is bought. This would go a long way in assisting cycle repair and maintenance.

## **Police and ZTSB**

Police powers on breath testing should be vigorously exercised to deter people from driving after drinking.

In a recent study on the epidemiology of RTA, it was quite clear that cycle accidents were under reported because most did not involve motor vehicles. What then is needed, is for the police accident records to be coordinated with hospital accident and emergency records to provide full and accurate picture of cycle accidents. These should include figures on adults and children who fall off bicycles.

ZTSB should encourage motorists to have working features on their cars which would assist cyclists. For example, wing mirrors and indicators, bars on lorries to prevent cyclists falling under the wheels, siting of exhaust pipes on the right-hand side of vehicles so that exhaust emissions are expelled away from cyclists (Fig.17).



**Fig.17: Siting of exhaust pipe beneficial to the cyclists.**



## **Employers**

Traffic congestion, air pollution, scarce parking, occasional petrol shortages, ever rising fuel prices and parking fees, tardy employers, the litany can go on and on. This is costing the employer substantial amount of money in terms of reduced employee productivity and effectiveness, lost work time and in some cases expensive employee benefit package. Employees should be encouraged to take holistic approach to work and to seek to define its place in their life as a whole.

Employees are more likely to work for, and loyal to employers who appreciate their personal needs and the needs of their family. There is, therefore, a lot that the employer could to promote the bike to work programme. There are lots of techniques and these include the following:-

- \* Offering to reimburse employees for official travel by bike at modest rate of 20 to 25 cents per kilometre.
- \* Allowing the employees who cycle the advantage of having flexible working hours so they can avoid peak hour traffic congestion and darkness.
- \* Paying employees their hourly wage for time spent in bicycle commute.

- \* Formation of a company bicycle club.
- \* Offering a lunch time bicycle maintenance and safety workshops.
- \* Planning a "pedal with the Chief Executive Officer" or "Bike To Work Day" event where local recreation, transportation and public health departments are invited.

## Cyclists

A cyclist who maintains his bike will be assured of many years of dependable service even after many thousands of kilometres of commuting. A typical maintenance routine would include:-

- \* cleaning and lubricating the bike frequently
- \* making minor adjustments - saddle, handle bars etc
- \* occasional tune ups
- \* an annual overhaul at a bike shop

A cyclist should be able to accomplish successful commuting despite perspiration and inclement weather by:-

- \* riding in work clothes , carrying work clothes on the bike.
- \* riding at an easy relaxed pace and avoiding over-exertion
- \* taking a few moments to cool off, upon arrival at work.

Safely sharing the road with motor traffic is not difficult once a cyclist assumes an assertive and aware attitude and practice effective cycling skills, the right way to ride is as part of the traffic, going with the flow of the normal traffic pattern. Generally, the more a cyclist follow the normal traffic pattern, the safer and more predictable a cyclist becomes. Sharing the road with cars calls for an attitude of security and confidence. Once you have that attitude you can safely and enjoyably take on a commute to work in the city traffic or a long day's tour on almost any kind of road.

"Street Smart" booklet recommends the following for smart cycling:

- \* Learn and obey traffic laws.
- \* Remain alert at all times and watch the road ahead for any special hazards that cause a bike to fall. Do not suddenly turn, brake or accelerate. Be ready to put a foot down for balance.
- \* Learn how to use your brakes and stop safely before riding your bike in traffic.

- \* Do not skimp on safety equipment. A good commuting bike should have the following characteristics:
  - Comfort and proper fit. Buy a bike that fits your body's dimensions so that you are mounted in a relaxed posture and your pedal stroke is fluid and efficient.
  - Reliability and durability. Your bike should be ready to perform every day without fail.
  - Accessible brakes and shifters. The flat handle bar style best achieves this objective with brake levers and shift levers located closed the hand position.
  - Comfortable and efficient gearing. Any bicycle should be suited to the terrain of the commuting route. One-speed or three-speed may be sufficient for easy, flat terrain.
- \* Develop a commuting route that feels most comfortable to you with respect to distance, road condition, amount of traffic, road-way width, terrain and your own ease at handling the bike.
- \* Regardless of where you store your bike, you should always lock it when out of sight, even for a few minutes.
- \* Register your bicycle serial number and identity with the police or local authority.
- \* Cyclists need to form cycling clubs or associations which lobby for cycling.

## REFERENCES

1. *Transport and Development*. International Bicycle Fund. 2. 1993.
2. Rosenbaum, WA. *Energy, Politics and Public Policy*. John Hopkins University Press, Baltimore. 1981.
3. Dunkerly, J. et al. *Energy strategies for developing nations*. John Hopkins Press, Baltimore. 1981.
4. Kingsley, P. *Adaptations to appropriate technologies*. African Social Research, University of Zambia, Institute of African Studies. 1990.
5. Watson and Gray. *Penguin Books of the Bicycles*, Macmillan, London. 1979.
6. The Messenger. *China - Fact and Figures*. New Star Publishers 1991.
7. British Medical Association. *CYCLING, Towards Health and Safety*, Oxford University Press pp. 2 1992.
8. British Medical Association. *Health and Fitness Benefits of cycling*. In: *CYCLING, Towards Health and Safety* Oxford University Press p. 10 1992.
9. Kickbusch, I. *A Strategy for Health Promotion: A Description of the Health Promotion Programme at the Regional Office for Europe*. World Health Organisation, Copenhagen, 1989.
10. Madzivire, DM., Amosun, SL and Gatsi, L. et al. *A epidemiology of road traffic accidents*. Abstract. Medical School Research Day. Harare. 1993.
11. Banister, C. *Existing travel patterns: The potential for cycling*. In: *CYCLING AND THE HEALTHY CITY*. Friends of the Earth. London. p.20-28.
12. Hillman, M., Adams, J., and Whitelegg, J. *One False Move... A Study of Children's Independent Mobility* Policy Studies Institute, London, 1991.
13. Sithole, SD., Moyo, N and Macheke, M. *An assessment of lead pollution from vehicle emissions along selected roadways in Harare (Zimbabwe)*. Intern.J. Environ. Anal. Chem., 53: 1-12. 1993.
14. Taylor, R. *Noise* (Penguin Books, 1979).
15. Morris, J. *Cycling and Health*. In: *CYCLING AND THE HEALTHY CITY*. Friends of the Earth. London. p.14-19.

## ACKNOWLEDGEMENTS

Many thanks are due to Ms Trudy Van Omeren, IOCU, Africa Region Transition Director, who made it possible for us to get the funds for the project. The principal investigator would like to thank Mr Muchaneta Nyambuya, MD, Consumer Council of Zimbabwe, Mrs Doreen Mukwena and Mr Leo Dhliwayo both at the CCZ head office, for assisting in the administration of the project. Many thanks are also due to Mr Beavan Mutsakani and Tennyson Maarira, BSoc.work students, and Elton Manyanhaira, BSc.Rehab student for helping in gathering the information and data. In addition to Lawrence Gatsi for his help and support. All photographs were taken by Ms Nodumo Tshuma, Audio Visual Technical Unit, University of Zimbabwe. My hearty thanks to Miss Gladys Mudekwa for the patience and valuable secretarial assistance during the preparation of the manuscript.

As always the author is solely responsible for the report's shortcomings.

