

ALTERNATIVAS DE TRANSPORTE EN AMERICA LATINA:

LA BICICLETA Y LOS TRICICLOS

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Summary
(Resúmen en inglés)

The transportation system in Latin America is clearly differentiated and is dominated by motorised vehicles: buses for the lower income levels, private cars for the elite. Anything which has a motor is considered as a symbol of progress and of prestige. Young boys in Bogota who earn tips by watching over parked cars, usually address their owners as "Doctor", which in some cases is true, but in all cases the title increases the tip.

Today, ownership of a private car is no longer identical with membership of the elite, but it is still a symbol of membership of the middle class, and thus of the wealthier minority. And it is a strong symbol of upward social mobility. Thus, the dream of owning a car is even very popular among the poor. Anyone who has experienced riding in a crowded bus during peak hours, looking through the window at a well-dressed man, comfortably seated in his car, can understand this dream. Even if the private car moves at the same slow speed as the bus, there is no comparison in comfort and safety.

Motorised transportation is also associated with power, status and dominance: middlemen

in rural areas owe much of their monopolistic power to truck ownership. In a more symbolic manner, this also applies to bus drivers, whose social status can be very high in relation to their passengers: drivers of modern interurban buses in Colombia are very often well-dressed "kings of the road" with a status close to pilots, and even the low-paid urban bus drivers in Bogota exert a rather aggressive power over pedestrians, cyclists and other drivers while catching passengers during their famous daily "penny war".

There is no doubt, Latin America is strongly influenced by an "automobile culture", and the dream of a "modern" automotive society is a common dream, which unifies right and left, rich and poor, old and young. But is it a realistic dream?

First of all, as is true of many dreams, it represses an unpleasant part of reality. It represses acknowledgement of the fact that motorised transportation is a very minority pleasure: out of every thousand inhabitants only 5 are car owners in Haiti, only 7 in Bolivia, only 60 in Brazil, only 90 in Venezuela, compared to 300 in Europe and 500 in the United States. And even if public bus transport is

relatively cheap and the service rather efficient, many people still cannot afford it, and transport by foot, ox-cart, mule, cycle is still widespread. Motorised transport could be defined as the formal sector of transportation, and the fact that there is also a very important, efficient and popular informal sector of transportation has been suppressed or ignored. Since official statistics only talk about the formal sector, the size of the informal sector of transportation is usually greatly underestimated. Informal means of transport often hinder the traffic flow of the formal sector and, therefore, informal transport has quite often been legally proscribed: the banning of rickshaws in Jakarta is only one example of a direct prohibition of informal transport. There are, however, quite a lot of implicit or explicit measures taken against popular means of transportation. In any case, if informal transport has not been hindered explicitly, it has almost never received any promotion and with just a few exceptions, weak and vulnerable traffic participants do have, in practice, fewer rights compared to the fast and powerful vehicles.

The dream of motorization is also a very costly dream. Even if motorised transportation does only reach a minority, it consumes a disproportionate amount of resources: Venezuela spends half its public works budget on roads and highways. In Colombia, fuel is heavily subsidised, and countries like Haiti or El Salvador spend one third of their import-budget on transportation equipment. Motorization is increasing very fast, despite oil and debt crises, but it should become more and more evident that the dream of an automotive society can never be a democratic dream, and the disproportionate price of making the dream more democratic could cause a severe headache even for the growing middle class, when it wakes out of its, motorised dreaming to face the bill. A transportation policy which is strongly biased in favour of motorization is thus an irrational strategy. (See Chapter 1)

As many informal means of transportation are not only cheap but also very efficient, a ra-

tional transportation policy should take the informal sector into consideration. And as bicycles and tricycles belong to the most efficient vehicles, they should play an important role in the transportation policy. Of course, bicycles are not very suitable for crossing the Andes; but even people living in Andean villages do not cross the Andes all the time: a Peruvian farmer's family will cross the Andes maybe once a month, but they will go twice a day to their fields, carry water and firewood, bring onions to the market, etc. In short: most trips in rural areas are within a range of 3 kms and are either on flat land, where bicycles could be used, or on such steep and narrow paths, that not even Jeeps can get through. In any case, it is a fact that only a minor percentage (according to a study in Kenya less than 10 %) of all rural trips are motorised trips.

Bicycles are most efficient and are unbeatably fast on flat land and over short distances. In flat and small or medium-sized towns no vehicle is faster (door to door) than a bicycle. As bicycles do not pollute the environment and occupy only a fraction of public space compared to private cars, they are an ideal means of transportation for small and medium sized towns. But as they are vulnerable and weak, they have to compete with motorised transport in a very unfavourable position; cycling can be very dangerous for the rider, if his rights are not carefully respected. Even if bicycles do not necessarily need special and separated cycleways, they can only participate in mixed traffic if they are taken seriously. Promoting bicycles as a popular means of transportation requires a change from an "automobile culture" to a "bicycle culture". (Chapter II)

The bicycle is also a serious option for mass transport in big towns, mainly if it is complementary to public transport. One of the main advantages of bicycles - besides their high speed over short distances - is the fact that they use only one sixth of the space of a private car while moving and only one tenth while parking. A road can absorb around 5000 cyclists per hour and track, very similar to what bus transport provides, while the same road can only absorb around 1000 to 1800 passengers in private cars.

A simulation of different scenarios of the projected traffic in Bogota in the year 2000 shows that a heavy promotion of bicycles and public transport is not only the cheapest way of expanding the transport system to the needs of a fast growing and increasingly mobile population but it also shows that the system will presumably collapse, if private motorization continues at the same speed as now. In 1980, Bogota with its 4 million inhabitants had a motorization rate of 4 %, which is expected to increase to 10 % by the year 2000. If the population doubles and mobility rises from 1.5 trips to 1.9 trips per day, all these factors together would require a three to sixfold expansion of the present road network. A combined scenario with a massive use of bicycles, buses and the building of a subway system would be three times cheaper than the "do-nothing" alternative of unhindered private motorization. Thus, even the subway, which is planned for Bogota, but which will probably never be realised due to the "presumed high costs", would be much cheaper than a "laissez-faire" strategy. (Chapter II, Part II).

A massive use of bicycles could also provide a substantial reduction of the energy bill: a simulation study on El Salvador shows that bicycles would have the most significant energy saving and substituting impact, more than the massive utilization of any other renewable energy source. (Chapter II, Part III)

Even though bicycles are not as widely used in Latin America as in Asia, there are presently more bicycles used than appears to be so to an ordinary observer or than statistical figures report. It is a proven fact that non-motorised transport tends to be underestimated in transportation studies; this is due to the fact that cycles are much less visible in traffic than cars. And therefore, most transport statistics simply ignore non-motorised vehicles.

But a sensitive observer will discover not only a very numerous, but also a very colorful world of cyclists: he will discover that a very ordinary bicycle can easily transport father, mother and two children. He will become aware of the fact that, while he was asleep, cyclists have brought him the newspaper

and that they have transported several hundred tons of newspaper before sunrise. He will see street vendors who, instead of trying to get the clients to their shop bring their shops to all the places where potential clients are crowding. And he will sometimes question what his teachers had taught him about physics when he sees a craftsman riding with his weekly production of 200 and more kgs on an old fashioned and rusty ordinary bike to the marketplace. (Chapter III)

There are certainly more types and makes of bicycles and tricycles available than the whole range of motor cars: front-seat tricycles, front-load tricycles, with many gears and with no gears, with brakes and without, heavy duty load bicycles, trailers for loads or for children, bicycles for off-road and for paved roads, and even bicycles for driving on rail tracks. (Chapter IV)

Many people in Latin America earn their living with bicycles or tricycles; those who use their bike for going to work may use it because it is faster or because it is healthier, but most people cycle, because it is cheaper than going by bus. They sometimes risk their lives in an unfair battle with motorised traffic.

As bicycles and tricycles are most popular among the poorest sector of the population, even the relatively low investment can be too high for them. Tricycle drivers who cannot afford to have their own tricycle are very often crudely exploited by other - still poor, but less poor - owners: the tricycle drivers of Santo Domingo have therefore organised themselves in an "Asociación de Tricleros", to defend their rights and get access to credit. But also in the formal sector of the economy, tricycles can be a very interesting option for cheap and efficient transportation: the biggest industrial bakery of Bogota has replaced most of its trucks with 900 tricycles. Its products are sold in more than 60'000 small shops in Bogota, and regular delivery posed a severe logistic problem; in most cases, trucks were too big to be parked close to the shops, and as delivery mostly took place in small quantities, most of the trucks' loading capacity was not really used. The

new distribution system is much more efficient, but required a completely new marketing concept: instead of centralised delivery from the bakery to the shops, several storerooms had to be created. These are still delivered to by big trucks, but from the storerooms to the shops, delivery takes place by tricycles. (Chapter V)

Pedal power is very widely used in stationary appliances, too: a very substantial share of the world's textile production is still sown on millions of foot-powered Singer sewing machines, and not with electricity. The range of pedal driven devices includes pumps, spinning devices, grain mills, pottery wheels, and even dentist's drills driven by a pedal powered air compressor. (Chapter IV)

To consider bicycles as an example of old fashioned, simple technology is quite misleading: since the first draft picture of a bicycle in 1493 by Leonardo da Vinci quite a lot of scientific and practical improvements have been made and similarity of the bicycle of 1900 to that of 1985 is due to the fact that the bicycle was almost perfect already at the beginning of this century. In terms of energy conversion, there is no more efficient transportation device: even walking consumes more energy than biking. (Chapter VII)

But even if many bicycles have a similar appearance, there are many quite substantial and sometimes invisible differences: the lightweight frame of a racing bike may be made of a very sophisticated alloy, while an ordinary bike made in a small workshop in the third world can have a frame made from water pipes. Even more variety exists for parts and accessories, such as the type of brakes, gears, tyres etc. (Chapter VIII)

As a bicycle consists of more than 1000 parts, bicycle production requires a high degree of division of labour. A bicycle factory is - in contrast to the usual belief - not a factory which produces under one roof all these different parts; each part requires very specific production procedures, and the production of a frame or a tyre, of a chain or a lamp, makes specialization necessary. There is no single country in the world which produces all the parts needed to make a bicycle.

A bicycle factory is usually a frame factory, where all other parts are bought from outside; sometimes these parts are assembled in the factory, sometimes assembling is done by the retail shops.

Even very big factories in India with a production of several thousand bicycles a day usually produce only the main metal parts of the bicycle; all other parts, such as chains, saddles, tyres and spokes are bought from other factories. A very typical aspect of bicycle production is the "cluster" form of the bicycle industry in Ludhiana, India, where some big factories are surrounded by more than 800 small part factories. (Chapter IX)

Bicycle production can thus be very decentralised, whenever a regular supply of parts is guaranteed: economies of scale in the bicycle industry do exist, but only in the specialization on the production of parts; the essential production task, the making of the frame and assembly, can be performed in small workshops. Relatively small metal workshops can produce reasonable frames rather cheaply if labour costs are not too high, whenever they have access to quality tubes and welding equipment. Assembly can be done with almost no equipment, and an assembly plant and repair shop does not need much more than 50 Dollars worth of simple tools.

On the other hand, decentralised production and assembly is only feasible, if a regular supply of all parts is provided, and this requires an efficient organization. Creating a new bicycle industry in a small country should start in any case with assembling, based on imported parts; in a later stage, the frame could be produced locally and step by step some part factories could be created. In order to provide the central management for the importation of raw materials and parts, a "Bicycle Promotion Agency or Association" should be created, which delivers parts and accessories to small workshops. It is also recommended to start such an enterprise with the importation of bicycles in CKD-condition, that means to import entire bicycles in "completely knocked down" sets for local assembly. Some Indian manufacturers specialise in exporting CKD bicycles to Third World Countries, and a pre-feasibility

study has shown that decentralised assembly in several small workshops, combined with one centralised management and import unit, could be viable with a production of 6000 bicycles a year. The final sales price of such bicycles would be less than 100 Dollars. (Chapter IX and X)

To create a "bicycle culture" requires intelligent promotion strategies. A very interesting social experiment is taking place in Bogota, the "ciclovias dominicales", which consists of closing 80 kilometers of arterial roads to motorised vehicles every Sunday from 8 am to 1 pm. The people of Bogota responded enthusiastically to this new opportunity of reconquering public space for recreation: every Sunday half a million Bogotanos celebrate a popular festival in their capital. They ride bicycles, they walk, they use their rollerskates, show the latest jogger's fashion or their artistic skills by riding a skateboard while doing a handstand. The former mayor of Bogota introduced the ciclovias mainly as a measure to present people with a new opportunity for recreation, which, however, did not cost anything. It was to his own surprise that this measure also had an incredible and unexpected impact on the pacification of one of the most dangerous and aggressive cities: traffic regulation can be done entirely by schoolchildren and even the thieves enjoy a free day on Sunday.

What is still considered as an outstanding recreation policy, will more and more take shape also as a new urban dimension and as a base for a new transportation policy: the construction of permanent cycleways in Bogota and other Colombian cities is now being taken into consideration. (Chapter XI)

It would be a mistake to consider the bicycle as an old fashioned means of transportation which has been gradually replaced by more efficient motorised vehicles. Industrial countries also face a very significant re-vival of the bicycle, not only for recreation, but also for daily transport. The bicycle has always been very popular in Holland, where it never lost its role as a serious means of transportation; many other cities in Europe are again giving emphasis to the construction

of cycleways. After two decades of a transport policy strongly biased in favour of motorised vehicles it has become evident that the adaptation of cities to motor cars leads finally to the elimination of urbanity. Thus, instead of building urban highways and subterranean parking lots, traffic planners are becoming much more concerned with pedestrian zones and freeing cities from cars. One of the most advanced and rational urban concepts for promoting the bicycle takes place in the city of Erlangen in Germany. For the last ten years, the mayor of that city has followed a consistent promotion policy for the bicycle with the result that the use of the bicycle has risen from 14 % to 25 % of all trips. The mayor insists that this has been achieved by very soft measures and with very low investments and he recommends a policy which gives equal rights to the bicycle for all cities in the Third World where the topography and the climate allow its massive use. (Chapter XII and XIII)