# Vehicle Mix and Road Space in Dhaka: The Current Situation and Future Scenarios

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**Summary**
Traffic is an enormous problem in Dhaka, and important decisions need to be made about reducing traffic jams. While many officials and others blame rickshaws for Dhaka's traffic problems, it is important to look at the actual situation on Dhaka's roads, in terms of how many people are getting about and how much space they require to do so. Only through an analysis of our streets can we make sound decisions about traffic management.

This paper looks at the percentage of passengers being moved by different modes, and the amount of road space those modes require. Analysis of number of passengers per mode, road space required, and other factors reveals that while rickshaws take a significant amount of road space, they also move a similar share of passengers to the space they require, while cars take up a similar amount in order to move very few people. It is thus clear that it is private cars, not rickshaws, that are the main contributors to our traffic jams, and that while policies to reduce rickshaws will be of little effect, policies to reduce the use of private cars will greatly alleviate the traffic jams—benefiting current car drivers as well as all other road users.

This paper also shows how a shift from private cars to public transport (buses) and non-motorized transport will result in a number of other significant benefits to our environment, economy, health, and society.

While it is easy to blame all our traffic problems on the rickshaw, it is important to make our decisions based not on personal prejudices but on the facts. After all, allowing our policy to be based on biases towards elite groups will hurt not only the masses, but the very elite that were meant to benefit. How much wiser to develop policies that allow for freer movement of everyone, while also improving other aspects of our lives, health, environment and economy.

International experience
Let us remember that no city in the world has eliminated or reduced traffic jams by banning rickshaws, though some cities certainly have tried it—including Bangkok and Jakarta, both famous for their intolerable traffic jams despite having long since banned rickshaws. In fact, traffic jams are a dominant feature of car-dependent cities, be they rich or poor, Western or Eastern. Better traffic control, more roads and flyovers, and more lanes in existing roads do not eliminate traffic jams; car traffic simply expands to fit all available space. Meanwhile, the extra road space will have been built by tearing down destinations that then move farther apart, creating more need for travel. In addition, investment in roads means less money available for investment in public transit and improvement of footpaths—and thus more reliance on cars, more need for roads, and the building of yet more roads. The vicious cycle never ends, and traffic only worsens.

**Cars, Fuel, and Government Expenditures: Lessons from Indonesia**

"In the revised 2004 state budget, currently being deliberated by the House of Representatives, the government proposed a whopping 63 trillion rupiah (EUR 5.6 billion) fuel subsidy, almost equal to the 69.6 trillion rupiah proposed for development spending throughout the year. The ballooning fuel subsidy has caused

concern as it has hampered the government's efforts to promote education and health programmes. Critics note that it has been enjoyed by car owners rather the poor, and a large volume of the subsidised fuel has been smuggled out of the country."[1]

Los Angeles, California is the most car-centric city in the United States, and has the worst traffic jams in the country. The average commuter spends 93 hours a year, or almost four whole days, stuck in traffic.[2] An astounding 70% of space in downtown Los Angeles and Houston, Texas is devoted to the car: roads and parking.[3] That leaves only 30% for people to use. How much space in Dhaka have we already lost to the car? How much more can we afford to lose?

In Bangkok, an estimated $1.4 million worth of fuel is wasted daily by vehicles idling in traffic; there are further economic costs due to hampered ability of businesses to deliver goods and services, and increased employee commuting times. Yet Bangkok banned its rickshaws in 1960 and has virtually no other non-motorized transport (NMT)—the few brave cyclists usually stick to the footpaths. People lose an average of 44 working days each year due to the time spent in traffic. According to the Engineering Office of the Bangkok Metropolitan Administration, had those 44 working days been put to productive use, the gross national product would have grown by another 10%.[4] Yet Bangkok has extremely high expenditures for building new roads.

In the early 1980s in Jakarta, the government spent US$1,800 million on urban road improvements. These included a six-lane urban motorway and by-passes. Over the course of 10 years, this construction expanded the city's road network by a mere 2.5%; meanwhile, the car population was rising by 10% annually. Road consultants on the project admitted that future road building would never be able to meet the demand for road space.[5]

The main source of space demands is the car, despite cars moving few passengers. In Bangkok in the late 1970s, cars took up 70% of road space, but transported only 28% of all passengers; in Manila in 1980, they accounted for 70-90% of all vehicles but only 28-40% of passengers; similar figures were found for Delhi in 1972. Meanwhile, while buses carried over 63% of all passengers in the above cities, they used only 12-29% of road space.[6]

While we may consider Dhaka's traffic to be horrible, it is helpful to remember that many other cities—though free of NMT—are even worse. Average traffic speeds during the evening rush hour in London in 1987-88 were a mere 11.6 mph; in Jakarta, only 9.3 mph.[7]

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[1] "Fuel Subsidy Problems in Indonesia," Strait Times, Sept. 23, 2004.
[2] http://www.capitolhillblue.com/artman/publish/article_5212.shtml
[3] J.M. Crawford, *Carfree Cities*. Utretcht International Books, 2002.
[4] Paul Guitink, Susanne Holste, and Jerry Lebo, "Non-Motorized Transport: Confronting Poverty through Affordable Mobility", April 1994. World Bank discussion paper.
[5] Rob Gallagher, *The Rickshaws of Bangladesh*. Dhaka: University Press Limited, 1992.
[6] Gallagher
[7] Gallagher

Simply put, an uncontrolled rise in private car use, no matter how much the infrastructure is increased to support it, leads to horrific traffic jams. Ironically, as traffic increases, fewer people experience mobility. In London in 1956, 404,000 people used the highways during rush hour; in 1996, the number of people on the highways was merely 251,000, yet traffic—the number of vehicles—is increasing. How can that be? The switch from buses to cars means more traffic jams, despite fewer people using the roads.[8]

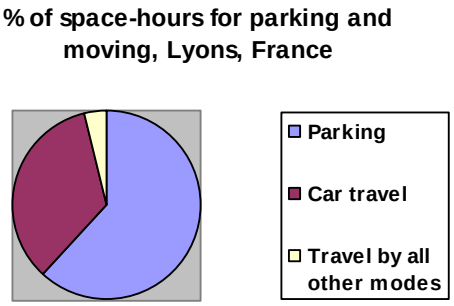
Cars cause problems not only when they are moving; they also require an inordinate amount of space for parking. There is an estimate that eight parking spaces are required for each car: one at home, one at the office, one at or near school, at different shopping centres and restaurants, etc.[9] When a car is not parked at home, it is either moving in the streets, or parked somewhere else; the space a car takes in the roads (moving or parked) is space not available to other road users, yet usually only one passenger benefits. Road space is also wasted when drivers drop people off, return home, then pick them up again; the distance travelled is twice that required. In contrast, rickshaws take up far less space in the roads, do not remain parked for long periods, and occupy very little space when parked.

**Parking vs. Moving**

Because private cars are parked more than they are driven, the amount of space required to park them is more important than the amount they require when moving. Thus the space advantage of rickshaws and bicycles over cars is even greater than shown in this paper.

In addition to the amount of space cars require to move on the roads is all the space cars need when parked. On average, cars spend 95% of their life parked; the fact that they may be able to move relatively quickly on the roads is irrelevant when most of the time they are blocking traffic by being parked on the roadside, or taking space away from other more valuable uses when parked off the road. One estimate is that for a 4 km round trip where a car is then parked for eight hours, the car consumes *6.7* times as many area-hours (space used = area occupied x time occupied) for parking as for travelling. The figure for bicycles is only *twice* the area-hours for parking as for moving. Another estimate is that parking uses 62% of the total space-hours of all personal travel in Lyons, France; moving cars meanwhile occupy 34% of the total space-hours, while all other travel (public transport, walking, cycling, and motorcycling) take only 4%.[10] Simply put, cars require an inordinate amount of space both while moving and while parked.

[8] J.M. Crawford, *Carfree Cities*.
[9] Hart, S. "The real cost of operating an automobile in America." *The Oregonian*, November 9, 1990; cited in Newman, P. and Kenworthy, J., *Sustainability and Cities, Overcoming Automobile Dependence.* Washington, D.C.: Island Press, 1999.
[10] Shoup, Donald, *The High Cost of Free Parking.* Chicago: American Planning Association, 2005.




Cities that increase road space simply increase their traffic problems, as people drive farther and more people buy cars. This is the lesson of Bangkok, Jakarta, Los Angeles, London, and innumerable other car-dependent cities. Cars are not an efficient or reasonable option for any decent-sized city: more cars mean more roads, more traffic jams, less mobility, and less space and money available for trees, parks, and alternate transport.

Meanwhile, cities that invest in public transit, make space for non-motorized transport, and restrict the use of cars—as has been done successfully in many places including Singapore, Copenhagen (capital of Denmark), Paris and Hong Kong—have fewer traffic problems and greater mobility, with less air and noise pollution and, over the long-term, great economic savings. By making less room for the car and providing alternate transport, cities experience "traffic evaporation". People wishing to avoid traffic jams drive less, and are more likely to use other forms of transport (walking, cycling, taking a bus). They avoid unnecessary trips, and make use of closer destinations rather than travelling to farther ones. By giving people space on the roads, they take it; by decreasing space, we can actually decrease the need for space. In so doing, we free up money (otherwise spent building and mending roads) and space (otherwise used for driving and parking) for transit, facilities for cycling and walking, trees, parks, and so on. This is a positive cycle, whereby people have a more pleasant city in which to move and live; the quieter streets encourage people to walk and cycle, thus further decreasing their need for cars.

The transport situation in Dhaka

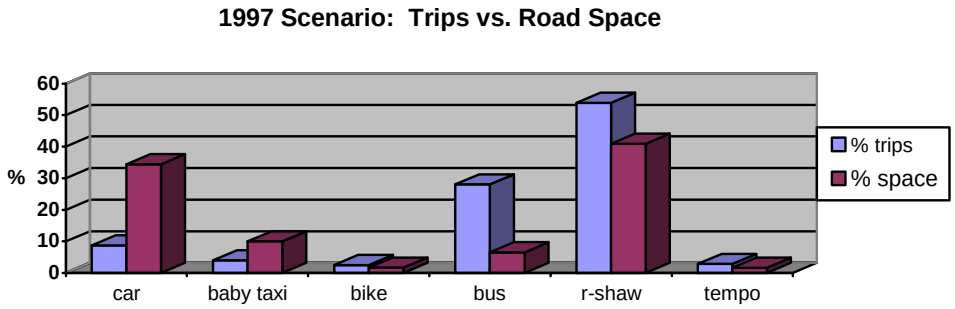
Let us now look at the current situation on the roads of Dhaka, in terms of what forms of transport are most common and how much road space they are taking.[11] As more current statistics are not available, we are forced to rely on statistics published in 1998; clearly, since then car use has greatly increased, though walking is likely to remain the main form of transport.

[11] It may be mentioned here that all the road space occupancy figures derived in the paper are based on space or static component of the vehicle interactions, i.e. Passenger Car Space Equivalency (PCSE) factors. Under the combined impacts of dynamic (speed) and static characteristics, the relative efficiency of vehicles would likely vary, particularly in rural highways. However, as far as passenger carrying capacities are concerned, even under combined impacts of static and dynamic interactions, rickshaws were found to be more space efficient than cars and motorized two- or three-wheelers. Interested readers are referred to Bari and Efroymson (2005) for further details.

In Table 1, we can see that in 1997 the most common form of transport ("overall mode share") was walking, with almost 63% of trips in Dhaka being made on foot. The second most common form of travel was by rickshaw, accounting for 20% of trips, and bus, accounting for 10%. When we exclude pedestrians and look at percentage of trips made by transport, we see that rickshaws accounted for almost 54% of all vehicular trips, buses for 28%, and private cars for less than 9%.[12]

**Table 1. Percentage Shares of Road Space by Different Vehicles in Dhaka, 1997**

| **Mode** | Overall Modal Share[13] | **Vehicular Modal Share[14]** | Average number of passengers per vehicle[15] | % Vehicle | PCSE[16] | **% of Road Space** |
|---|---|---|---|---|---|---|
| Car | 3.24 | **8.73** | 1.50 | 12.18 | 1.00 | **39.22** |
| Baby taxi | 1.48 | **3.98** | 2.20 | 5.56 | 0.82 | **10.01** |
| Bicycle | 0.94 | **2.53** | 1.00 | 5.29 | 0.10 | **1.70** |
| Bus | 10.42 | **28.03** | 52.00 | 1.17 | 1.80 | **6.54** |
| Rickshaw | 20.04 | **53.90** | 1.60 | 75.21 | 0.18 | **40.88** |
| Tempo | 1.05 | **2.83** | 10.20 | 0.59 | 0.88 | **1.65** |
| Pedestrian | 62.82 | | | | | |
| Total | 100.00 | 100.00 | | 100.00 | | 100.00 |




Although the average number of passengers per vehicle for cars and bicycles is an estimate, it is conservatively based on observation of vehicles in Dhaka. Bicycles would actually be higher than one, as they never travel empty and sometimes carry

[12] In this paper we look at passenger trips, rather than passenger kilometers. The reason is simple: we are concerned with the movement of *people*, and do not feel that long-distance travel should take precedence over short trips. One person travelling 10 kilometers to a workplace should not be given the same importance as 10 people each travelling 1 kilometer to their workplaces; in fact, if a decision had to be made, it would be better for 10 people to reach their workplace easily and conveniently than just one person. Improving footpaths to allow people to walk to work could thus be more important than adding a lane for those few travelling longer distances. By looking at passenger kilometers rather than passenger trips, we bias our system towards long-distance trips, which in the end simply increases congestion without increasing, and often while decreasing, overall passenger mobility.

[13] DUTP (Dhaka Urban Transport Project), Phase II (1998), Draft Final Report.

[14] *Ibid.*

[15] Source for baby taxi, bus, rickshaw and tempo: Mannan, M.S. and Karim, M.M. (2001) "Current State of the Mobility of the Urban Dwellers in Greater Dhaka", Paper presented for the 94th Annual Conference and Exhibition of Air and Waste Management Association, June 24-28, Orlando, Florida, USA. Other estimates based on observation.

[16] Ali, S. A. (2004), Development of Speed-Flow Relationship Under Mixed Mode Traffic– Ongoing research in the University of Birmingham, UK.

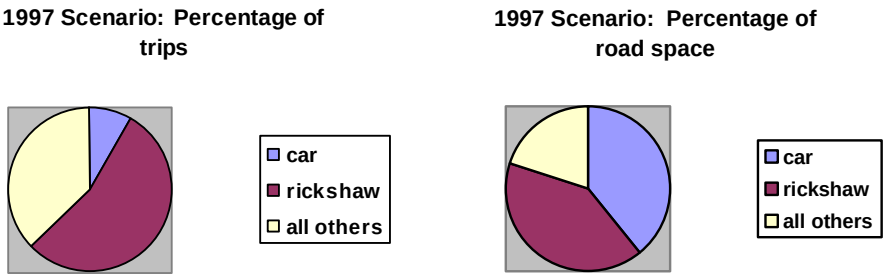
two passengers. Cars often carry only one passenger, and sometimes none, in the case of a driver dropping off a passenger and returning empty.[17]

Percentage of vehicles refers to the breakdown of the vehicles on the streets—out of 100 vehicles, how many are buses, cars, etc. We see that the most common vehicle on the street was the rickshaw, accounting for over 75% of vehicles, followed by cars at over 12%. Bicycles represented over 5% of the vehicles, and buses just over 1%.

PCSE refers to Passenger Car Space Equivalence, or the amount of space a vehicle requires in comparison to the private car, which is set at one. The calculation includes headway—that is, the distance between vehicles, which is greater for vehicles travelling at a faster rate. Ten bicycles can travel in the space of one car; a bus takes up the same amount of space as less than two private cars.

Finally, we look at the percentage of road space in Dhaka being taken up by each transport mode. In 1997, baby taxis took up 10% of our road space, bicycles less than 2%, buses 6%, cars 39%, rickshaws 40%, and tempos over 1%.

The following pie charts illustrate this graphically. In the first, we show the percentage of trips made by different modes. In the second, we show the percentage of road space. Clearly cars are the worst offenders in terms of the amount of space required to transport a limited number of people.



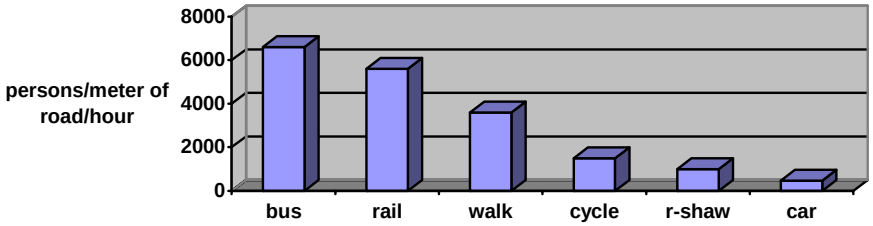

It is true that rickshaws took up a larger share of road space in Dhaka than any other vehicle. However, in return for the 40% of road space they required, rickshaws transported almost 54% of vehicular passengers, while cars, taking up 39% of road space, transported less than 9% of passengers. **In terms of wasted space, it is thus clear that cars, not rickshaws, are the main culprit.** Bicycles took up 1.7% of road space but transported 2.5% of passengers, and are thus efficient; buses took up only 6% of road space but transported 28% of passengers, and are thus very efficient. Baby taxis are similar to cars in taking up a disproportionate share of road space for the amount of passengers they transported (10% of space but only 4% of passengers).

Rob Gallagher estimates that the average private car passenger takes up about 45% more road space than the average rickshaw passenger, and 5-10 times as much space as each bus passenger.[18] The reason is a combination of the rickshaw's smaller size,

[17] Mannan and Karim find that minibuses on average carry 36 passengers and taxis 2.2 passengers. These vehicles are not included in the tables as we do not have the other information for them.
[18] Gallagher

greater maneuverability, and minimal headway requirement. Gallagher also finds that in one hour, 3,500 rickshaws passed in one direction in a 19-feet wide rickshaw lane. The figure would have been higher if there had not been parked cars blocking part of the lane. The maximum number of cars that can pass down a similar road (20-feet wide, one-way, with no parking allowed) is only 2,800 per hour. This allows for significantly (25%) more passengers per hour if the number of passengers per private car is the same as for rickshaws. As shown in the following chart, if the goal is to move the most passengers, it is thus more efficient to allocate road space to rickshaws, not private cars.

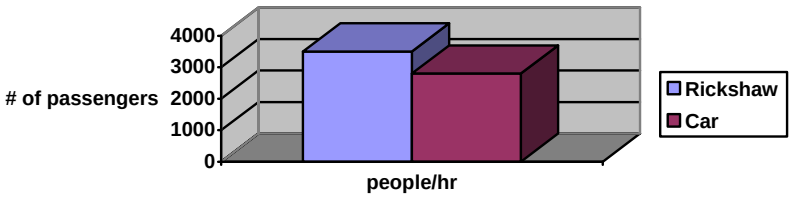
**Maximum Passenger Flows by Mode, Gallagher's estimate**



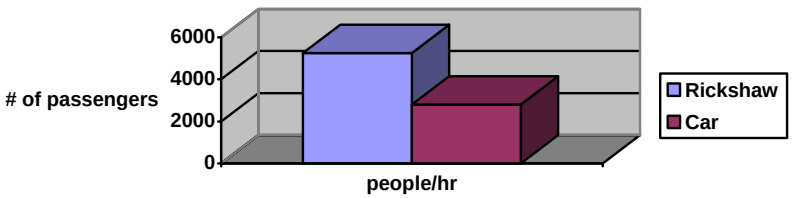

*Notes: Car occupancy rate assumed at generous 2.2 passengers/vehicle, and rickshaw at 1.2 passengers/vehicle. Maximum rickshaw flow based on observations in Old Dhaka. Assumes cars in one-way street, rickshaws in rickshaw lane, bicycles in bicycle lane, and bus in separate bus lane.*

Source: Gallagher

**Passengers moved per hour (car vs. rickshaw), one passenger per car and per rickshaw**




**Passengers moved per hour (car vs. rickshaw), one passenger per car and 1.5 per rickshaw**



It is true that rickshaws can slow the speed of motorized vehicles, and thus decrease their efficiency. However, two caveats exist. First, actual road conditions need to be considered when estimating vehicle speed. The speed at which a vehicle can travel on an empty road without traffic signals is irrelevant to actual use in a city. Given vehicles entering and exiting the main street, traffic signals, the crush of traffic, and other impediments to speed, even in situations where there are no non-motorized vehicles, motorized vehicles reach far less than optimal speed. As mentioned above, traffic jams are an enormous problem in cities without non-motorized transport, bringing down the speed of cars to that of bicycles or less.

**Air Pollution: What is the Main Cause, Cars or Rickshaws?**

Cars pollute as soon as they are turned on, whether they are moving or sitting still in traffic. To blame air pollution on rickshaws because they slow down cars is outrageous. Even when moving smoothly and well-maintained, cars pollute; internationally, cars are the major polluters of our air and the major contributors to climate change. Worldwide, the most air pollution is created by the United States, not because their cars are slowed by rickshaws, or because their cars are poorly maintained, but because Americans drive so much. Cars pollute; lots of cars pollute a lot. CNG is cleaner than other fuels, but as it is a carbon-based fuel, it still releases carbon dioxide into the air as well as the cancer-causing chemical benzene, for which no safe level of exposure is known. People travelling by foot, bicycle, or rickshaw arrive at their destination without contributing to air pollution; people travelling by a motorized vehicle, even a bus, contribute to air pollution. While the rich are the main sources of air pollution, *everyone* breathes the air. Meanwhile, if the rich believe they are somehow immune to air pollution because they live with air conditioning, they might wish to remember that they too must breathe the same air that they are polluting; the more cars, the more they too will suffer.

Second, one must consider total travel time, not just the time spent in the vehicle. Travel by car includes time to start the car, move it from its parking position, and again to find parking. Travel by bus includes time to arrive at the bus stop, time waiting for the bus, and again time from the bus stop to the final destination. Since rickshaws generally involve door-to-door service with virtually no waiting time, for short trips they can provide faster *total* travel time than other vehicles which move faster on the road, but involve more waiting time.

It is car passengers—a mere 10-20% of all vehicular passengers—who anticipate the most benefit from the banning of rickshaws, but how much should we inconvenience the majority for the sake of the minority?

Moreover, since 70% of trips in Dhaka are short trips, most of them of less than two kilometres[19], rickshaws fulfil an important role. It is not efficient to use motorized transport for very short distances which can easily be covered without the use of fuel, emissions of pollutants, or creation of noise. As mentioned, rickshaws can also be the fastest way to get about for short distances, requiring as they do virtually no waiting time.

[19] "Integration of Non-motorised Transport in the Overall Urban Transport System of Dhaka: Traffic Management Plan for Zone 4", Draft Final Report prepared for UN-ESCAP, January 1998.

Are cars the ideal transport?

Let us return to the private car. Whatever convenience and comfort it provides comes at various costs. Cars are the main source of pollutants worldwide. There is no such thing as a clean car; cars just vary in the amount they pollute. Despite increasingly stringent emissions control standards over the decades in the US, cars pollute more than they used to—because people are driving farther.

It is difficult for us to appreciate just how much cars pollute. The air in Dhaka City, after all, improved dramatically after the banning of two-stroke baby taxis, and again with the introduction of unleaded fuel. However, this is by no means an indication that the air in Dhaka is clean. Any trip to the countryside is a reminder of the pleasure of breathing clean air. Even in Dhaka, if we wake up early and take a walk, we can experience a bit of the pleasure of fresh air; as each car passes, we can also understand just how much each car pollutes the air. As the streets fill with cars, the pollution rises. On hartal days, despite large numbers of people moving about the city, the air is fresh and the city (violence aside) is quiet. Cars—and the wide paved roads needed to accommodate them—also emit a great deal of heat, making Dhaka even more insufferable in the many hot months.

Cars also are the main cause of noise pollution. A full 97% of students in Dhaka in a survey on noise pollution said that their studying is disrupted by car horns; 96% of the general public interviewed mentioned car horns as the main cause of noise pollution in Dhaka.[20] When rickshaws were on strike in October 2004, there were no rickshaws on the streets, yet the streets were as noisy as ever.

We would argue that since cars only transport roughly 10-20% of travellers, they should only have access to 10-20% of road space, for moving and parking—and should respect the rest of users, as well as the right to some peace and quiet of all the people working and living next to roads.

Presumably one component of civilization is respecting the rights of others. The attitude of drivers—who represent the wealthiest portion of society—that they alone should have full access to roads—is anti-democratic, anti-civilization, and disturbingly elitist. A society in which people fail to respect the rights of others, and in which the rich believe they should have special privileges on the roads as well as in every other aspect of life, is a society destined to fall into crime, selfishness, viciousness, and lack of the neighbourly friendliness that allows people to live comfortably together.

**Children and Transport**

How did you travel to school when you were a child? Most likely by foot or bicycle, making the trip a source of fun, exercise, and social interaction. Yet despite our own childhood experiences, we seem to have forgotten the importance of independent mobility for a child's mental, physical, and social development. Children who must always rely on adults to get about are likely to be less self-confident, practical, and

[20] Dey, A.R., Kabir, N. and Efroymson, D. *Noise Pollution: Research and Action*. Work for a Better Bangladesh, Dhaka, August 2002.

self-reliant. Children who never or rarely travel by foot or bicycle are more likely to be overweight, and suffer the many subsequent health consequences (diabetes, heart disease, hypertension, etc.). Children who do not mix with other children on the way to school also gain fewer social skills, and are less able to interact in positive ways with other children.

Dhaka is not the only place where this is a problem. In the highly car-dependent UK, we see that in just 25 years, the number of 7- and 8-year-old British school children going to school on their own fell from 80% to 9%. This is not inevitable in the "modern" world; in the Netherlands, 83% of children still bike to school.[21]

Some parents are afraid to let their children walk or cycle to school due to the fear of accidents. In fact, half of US children hit by cars near schools are hit by vehicles driven by parents of other students, according to the National Highway Traffic Safety Administration. Research also indicates that driving children to school is a main source of traffic—in various cities in the US, around 30% of morning traffic is caused by parents driving their children to school. In the US in the late 1960s, 90% of children who lived within a mile of their school walked or biked. Today, according to the Centers for Disease Control and Prevention, only 31% of such kids do so.

Which will we emulate, the cities that allow children freedom of movement, or those that make them prisoners in the backseats of cars? Given the statistics from the US, the danger of continuing to drive our children to school includes the increasing probability that our children will be hit by the cars of other parents. Is this a way to live? Couldn't we create safe conditions for children to walk and cycle, and thus encourage their physical, social, and mental development as well?

Dhaka's future

Let us now consider some alternate scenarios for Dhaka. What if private cars continue to increase, and, to make room for them, rickshaws decrease? Newspaper articles, ads, easily-available bank loans, and comparatively low taxes on cars all encourage people to buy cars; the ability to park anywhere—even on footpaths and on major streets—for free, further encourages people to drive. Meanwhile, until a reversal of its position in February 2005, the World Bank has put pressure on the Dhaka City Corporation to ban rickshaw on major streets.

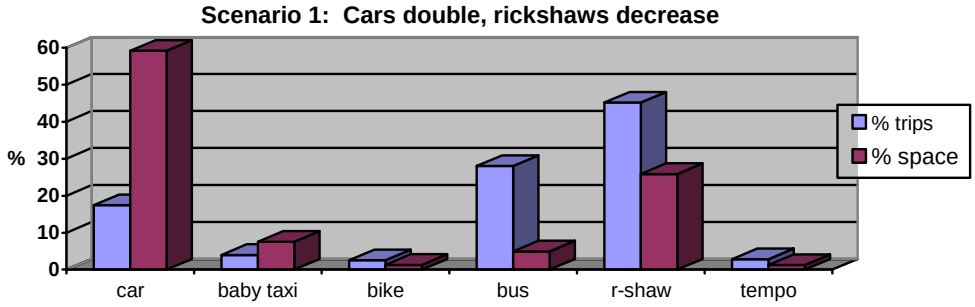
While we do not agree with any policy to reduce rickshaws in favour of private motorized vehicles, be they private cars, taxis, or baby taxis, we wish to show some possible consequences of reducing the quantity of rickshaws on Dhaka's roads.

**Table 2. Scenario 1: Compared to 1997, percentage of vehicular passengers travelling by car doubles, rickshaws decrease**

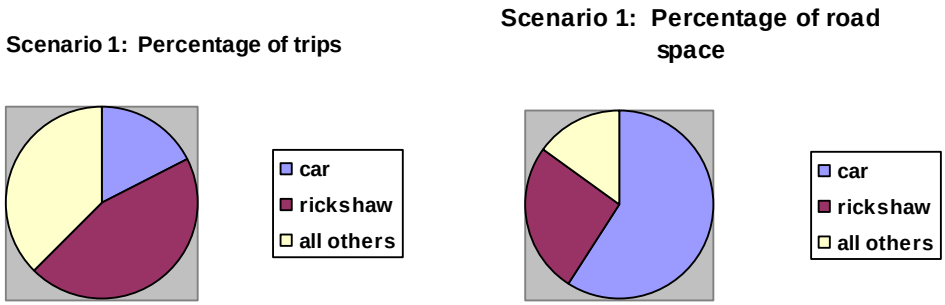
| Mode | Vehicular Modal Share | % Vehicle | % of Road Space |
|---|---|---|---|
| Car | **17.45** | 25.84 | **59.15** |
| Baby taxi | 3.98 | 4.02 | 7.55 |
| Bicycle | 2.53 | 5.61 | 1.28 |

[21] J.M. Crawford, *Carfree Cities*.

| | | | |
|---|---|---|---|
| Bus | 28.03 | 1.20 | 4.93 |
| Rickshaw | **45.17** | 62.71 | **25.84** |
| Tempo* | 2.83 | 0.62 | 1.24 |
| Pedestrian | | | |
| Total | 100.00 | 100.00 | 100.00 |




In Table 2, we present Scenario 1, in which the vehicular mode share—that is, the percentage of vehicular passengers—travelling by car doubles from the 1997 figures. (This may be very accurate for 2004, given the estimate of cars increasing by 12% a year.[22]) In order to move 17% of vehicular passengers, cars would require over half (59%) of road space. Rickshaws would transport only 45% of passengers, taking up only a quarter (25.8%) of road space. In addition to the extreme amount of space required by cars in relation to the number of passengers they move, there is another problem with this scenario: it would require **132%** of the road space available in 1997, without even considering parking or the increase in the average size of cars, thus increasing traffic congestion and/or requiring the building of more roads. Given the increase in cars since 1997, this could explain our current traffic jams.




That is perhaps the scenario some car owners dream of: they gain road space, and public monies are used to build more roads for them, while everyone else is forced to fight for the remaining space. By what theory is it fair to give less than 20% of passengers more than 59% of road space? (Given parking requirements, actual space would be far higher.) How much air and noise pollution would we endure under this

* Although tempos have been banned in Dhaka, microbuses perform a similar function.

[22] Hasan, K.M. "Status of Environmental/Social Impact Assessment of Road Infrastructure Projects in Bangladesh." Country Study Report prepared for UN ESCAP, August 1998.

scenario, how much money would be wasted on fuel and vehicle purchase and construction of roads and flyovers, and how much space would be taken away from pedestrians and others to provide parking for all those cars?

**Table 3. Scenario 2: Percentage of vehicular passengers travelling by car triples compared to 1997, rickshaws further decrease**

| Mode | Vehicular Modal Share | % Vehicle | % of Road Space |
|---|---|---|---|
| Car | **26.18** | 38.45 | **71.22** |
| Baby taxi | 3.98 | 3.99 | 6.06 |
| Bicycle | 2.53 | 5.56 | 1.03 |
| Bus | 28.03 | 1.19 | 3.96 |
| Rickshaw | **36.45** | 50.19 | **16.73** |
| Tempo | 2.83 | 0.61 | 1.00 |
| Pedestrian | | | |
| Total | 100.00 | 100.00 | 100.00 |

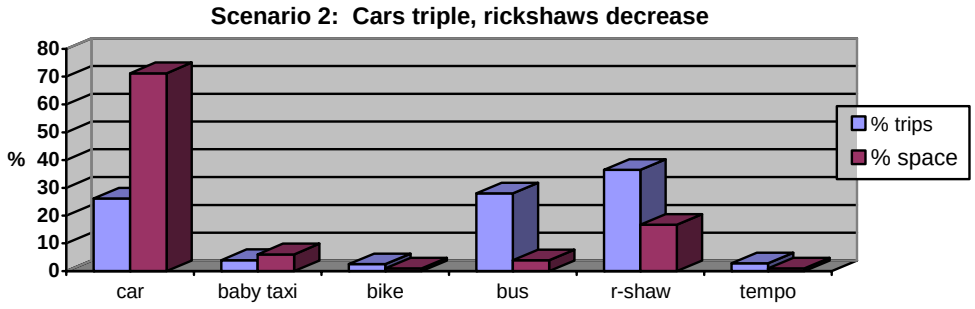
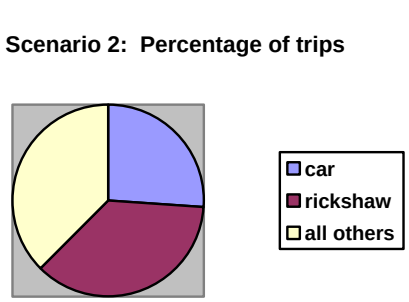
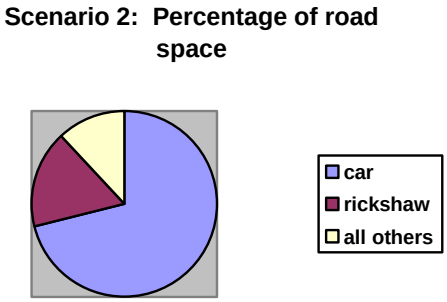



Table 3 presents Scenario 2, in which, compared to 1997, the percentage of vehicular passengers travelling by car triples. While cars would only transport 26% of the passengers, they would take up 71% of the space on the streets, leaving significantly less for the other modes. Rickshaws would still be the most prevalent vehicle, and would move 36% of passengers, for which they would use only 16% of road space. This scenario also suffers from the same problem as Scenario 2, but to a greater degree: it would require 163% of the road space in 1997. Tremendous congestion, great expenditure for new roads, and only a minority have convenient transport.

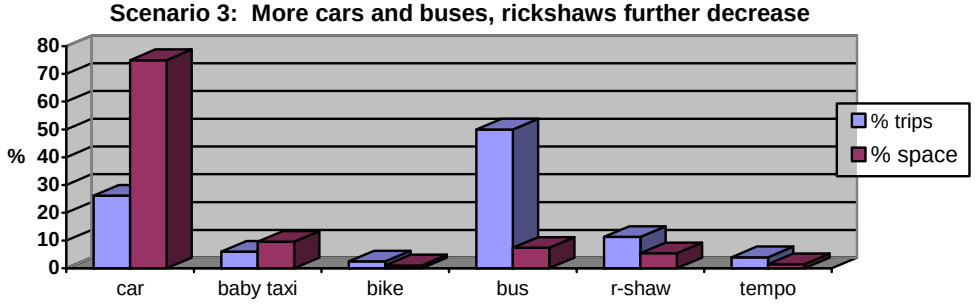


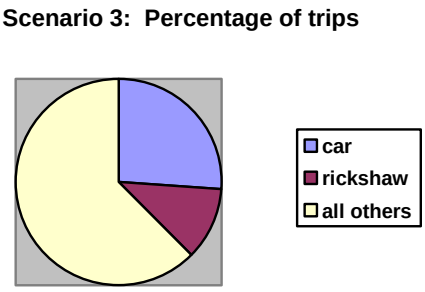
But what if the problem is still the rickshaws? What if we further reduce their use, giving them just over 5% of space on our roads (which might occur in the scenario suggested by the World Bank and transport officials, of rickshaws being feeders from neighbourhoods to bus routes) and allow cars to become the most prevalent vehicle? This is Scenario 3, which we present in Table 4.

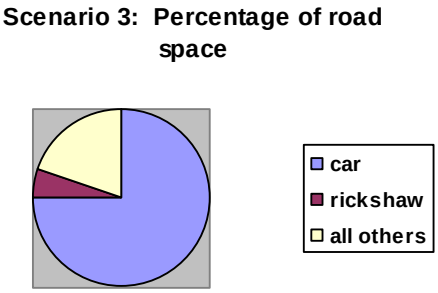
**Table 4. Scenario 3: Car use dominates, rickshaws further decline**

| Mode | Vehicular Modal Share | % Vehicle | % of Road Space |
|---|---|---|---|
| Car | **26.18** | 56.09 | **74.94** |
| Baby taxi | 6.00 | 8.76 | 9.60 |
| Bicycle | 2.53 | 8.12 | 1.08 |
| Bus | 50.00 | 3.09 | 7.43 |
| Rickshaw | **11.29** | 22.68 | **5.45** |
| Tempo | 4.00 | 1.26 | 1.48 |
| Pedestrian | | | |
| Total | 100.00 | 100.00 | 100.00 |




Cars still account for just 26% of vehicular trips, and gain 75% of road space to do so, with most of the difference being made up by buses. Buses would account for half of vehicular trips, for which they still require only 7% of road space, though a huge investment in buses will also be needed. Baby taxis, though wasteful of road space, grow to assume 6% of passengers, thus taking 9.6% of road space, as people insist on motorized transport but can't all afford cars. In the thick fumes and intense noise of our city, the 2.5% of vehicular passengers travelling by bicycle struggle by with just 1% of road space; rickshaws, carrying 11% of passengers, must cope with only 5% of road space, having been banned from most roads. Motorized vehicles rule the day. There are extremely long lines for buses, and those forced to walk, cycle or ride buses encounter intense suffering. Meanwhile, the car drivers are *still* stuck in traffic jams (which now no one can blame on rickshaws), since they must compete with buses, and most of all, with other cars. In any case, this scenario is unthinkable: it would require over twice (**225%**) the road space available in 1997. Are we really prepared to tear down sufficient buildings to create the roads and parking for this motorized nightmare?




**The Cost of Road Building**

According to Gallagher, over a decade ago, Dhaka Municipal Corporation was spending 33 crore taka annually on roads. When we factor in the expenses of RAJUK and Roads and Highways Division, the expense rises to 100 crore taka, or (at the time) 200 taka per person in the city.

Back in 1987, the cost of four flyovers was expected to be 100 crore taka. A multi-storey car park would cost at least 20 crore taka. For the cost of the four flyovers, 30,000 decent homes could be provided for slum families. Money spent on transport is money not spent on basic needs. The expenditures increase our foreign debt, and yet are unlikely to solve our congestion problem, as they will never keep up with the increasing demands for road space.[23]

High as the earlier estimates were, the actual costs are even greater. The Mohakhali flyover alone cost 113.52 crore taka—and has not eliminated, or even reduced, traffic jams. Now it is suggested that more roads need to be built. Under what scenario will road construction ever meet demand? Would it not be wiser to invest in public transit, and in promotion of efficient, clean, inexpensive non-motorized transport?

Even with all the negatives involved, these scenarios don't entirely reflect reality. Many claim that cars will move more freely without the rickshaws in the way, and former rickshaw passengers will switch to taking buses or to walking. How long will it take before our bus services improve sufficiently to take on the increasing load? A study by Human Development Research Centre (HDRC)[24] found that one and a half years after the ban on rickshaws from Gabtoli to Russell Square, buses on that segment of Mirpur Road had still not increased sufficiently to meet demand—and that bus conditions make travel for women virtually impossible.

With more people using buses (rather than rickshaws) for short trips, those going longer distances will have even longer to wait than previously for a space on the bus, as short-distance travellers compete with them for space. Meanwhile, how practical is it to wait for 20-40 minutes for a bus in order to travel two kilometres or less? Will

[23] Gallagher

[24] Human Development Research Centre (HDRC), *After Study on the Impact of Mirpur Demonstration Corridor Project (Gabtoli-Russel Square)*. Prepared for Dhaka Transport Coordination Board (DTCB), August 2004.

bus stops always be available near people's destinations? For those not served by bus routes, or unwilling to wait so long, there will be few options but to walk.

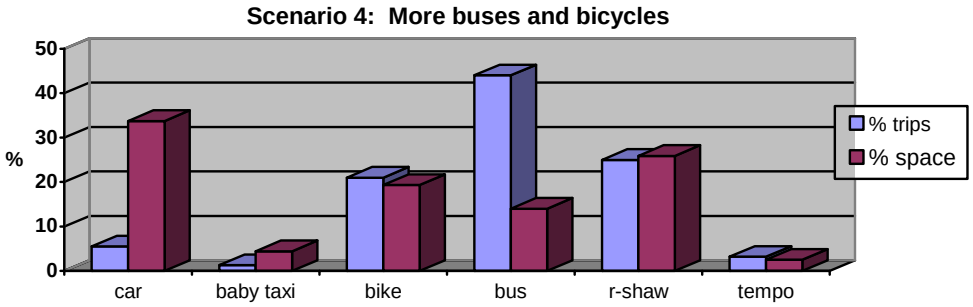
But what is the condition for walking in Dhaka? As it is, cars not only make our streets dangerous to cross and unpleasant to walk along (thanks to both the smell and the incessant honking of our drivers), but they are now taking over our footpaths as parking places. As pedestrians are forced to step into the street to avoid the various obstacles on our footpath, they will take up street space that the cars had expected to regain from the rickshaws. But pedestrians move far more slowly than rickshaws. They will of course be joined by the long lines of would-be bus passengers, who are already evident throughout the city, again taking up space on footpaths and streets.

What then will we have gained? Pedestrians rather than rickshaws will be blocking our streets, still making it difficult for our elite minority to pass freely. Will traffic jams then be blamed on bus passengers and pedestrians? Will those unable to afford a car be asked to sit at home so that car owners can move freely—or at least have the privilege of sitting in traffic jams composed only of private cars, as is the case in other car-dependent cities of the world?

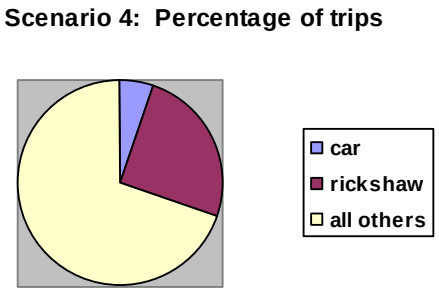
In Table 5 we present Scenario 4, cutting back on car use, baby taxis and rickshaws, while greatly increasing the percentage of passengers travelling by bicycle (to 21% of vehicular trips) and bus (to 44% of vehicular trips). In this scenario, 19% of road space is allocated to cycles, allowing 21% of vehicular passengers to transport themselves at very little cost and while creating no air or noise pollution. Car use accounts for only 5.5% of vehicular passengers (though requiring 33% of space). Rickshaws take up the same amount of space as the proportion of passengers they transport—25%. Again, this requires a heavy investment in buses, and a significant increase in cycling. The decrease in rickshaws would reduce mobility for women, small children, and the elderly, and also mean a decrease in employment for rickshaw pullers. There is one significant advantage over the above scenarios; only **78%** of 1997 road space would be required for this scenario. With people able to move much more freely, the question returns—why reduce the mobility of the least advantaged, and reduce jobs for the poorest, when space is available to accommodate them? Increasing private cars requires vast amounts of space to move very few passengers; isn't it wiser to choose more efficient transport?

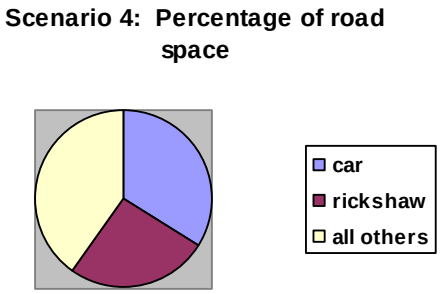
**Table 5. Scenario 4: Percentage travelling by car, baby taxi, and rickshaw decrease; bus and bicycle increase significantly**

| Mode | Vehicular Modal Share | % Vehicle | % of Road Space |
|---|---|---|---|
| Car | 5.5 | 8.72 | 33.75 |
| Baby taxi | 1.3 | 1.41 | 4.46 |
| Bicycle | 21.0 | 49.95 | 19.33 |
| Bus | 44.0 | 2.01 | 14.02 |
| Rickshaw | 25.0 | 37.16 | 25.89 |
| Tempo | 3.2 | 0.75 | 2.54 |
| Pedestrian | | | |
| Total | 100.00 | 100.00 | 100.00 |




An increase in cycling could easily be achieved by creating separate cycle lanes with barriers that prevent cars from entering/parking in them, and rickshaws from entering them; by greatly lowering import fees on bicycles; and by providing parking facilities for bicycles. This increase in cycling would have multiple benefits: greater mobility for the poorest (the bicycle is the cheapest form of transport after walking, and far cheaper even in the medium-term than buses), health benefits for those cycling (cycling is an excellent form of exercise), absolutely no contribution to air or noise pollution, no waste of money or resources for fuel, and an increase in people's interactions with each other, leading to friendlier and safer streets.




If bicycles increased, particularly if we could convince people to shift from using private cars to bicycles, traffic jams would decrease and fewer accidents would occur. If children could walk and bike to school, traffic jams would decrease even further, and children would be healthier and happier. The only way to achieve this is by having bike lanes only for bicycles (not shared with rickshaws), and divided with a barrier from other traffic.

In contrast to the increase in cycling, how likely is it that we will ever have sufficient buses to transport 44% of passengers, when in 1997 they only transported 28%? How efficient is it to use buses for short trips? An increase in buses will require significant investment to purchase more buses; bus service should also improve in quality as well as quantity. Problems of buses are well described in the HDRC report, including the lack of covered stands at bus stops, the habit of drivers not to stop completely when picking up and dropping off passengers, lack of availability of seats for women, crush of passengers when boarding for those services not using queues, lack of separate queues for women, and hassling of women on board the buses.
Advantages should be given to buses to increase their efficiency by creating separate lanes for buses on major roads, creating special bus-only turns, or even streets on

which buses are the only allowed motorized transport. If pedestrians actually increase (in distance if not necessarily in percentage of trips), there will be less need for vehicular transport, so that a *percentage* increase in buses as vehicular transport will be less than otherwise predicted (there being fewer vehicular passengers overall).

However, we must also recognize that this increase in the quantity and quality of bus services will require time and money. To make maximum use of buses—which, after all, still cause many of the problems caused by private cars (they pollute the air, are noisy, are dangerous to others, and either rely on fuel imports or on our limited supply of CNG)—they should be reserved for medium and long trips. Longer-term planning should also take into account the possibility of providing safer and less polluting forms of mass transit such as surface trams.[25]

By reducing private cars, we could regain a lot of space for alternate transport modes that serve far more people. If vehicles were allocated space according to the number of passengers they serve, bicycles, rickshaws, and buses would gain priority. With fewer motorized vehicles on the streets, the streets would be quieter, less polluted and safer; some of the space saved could be used to plant more trees and thus improve conditions for cycling and walking. These improvements would mean a further increase in cycling and walking, which would feed into a positive cycle in which ever fewer people would drive, and thus more and more space would be created on the roads—traffic jams would finally be reduced. Long-distance travel would be facilitated by buses, the vehicle of the majority, rather than cars, the vehicle of the elite few. With buses not having to compete for road space with other vehicles, bus service would improve, again leading to a positive cycle in which people gave up their private cars to travel by bus (their long trips by bus facilitated by short trips by rickshaw, bicycle, or walking).

As rickshaws are very efficient in trips provided per road space, as well as at providing pollution-free transport and helping ensure the survival of about 5 million of the poorest Bangladeshis, we would argue that rickshaws should not be reduced beyond current levels in favour of private cars and taxis. Some modal shift from rickshaws to more efficient modes of transport like bicycles and buses may be desirable, but this should not happen not by administrative force. This should only be achieved by adopting sound traffic management approaches, such as by:

- allocating a continuous cycle lane for all major roads
- creating separate bus lanes
- providing bus subsidies, increasing bus frequencies, reserving seats on buses for women, etc.
- separating rickshaws from other traffic through provision of rickshaw lanes on major roads

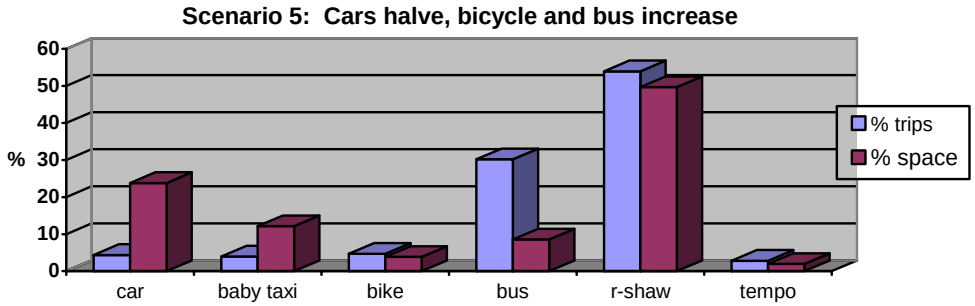
[25] While trams and trains are essential to public transit in most successful cities, there are significant barriers to their establishment in Dhaka. These include misuse of public funds (a problem that delayed by many years the introduction of the still-limited sky train in Bangkok), the need for a steady supply of electricity, the massive financial investment required, and the need for stability in planning so that a system can be carried out successfully even with a change in governments. Bus rapid transit (BRT) is by far the least expensive form of public transit, followed by surface trams; both sky trains and subways are many times more expensive than transit that runs on our roads.

To reduce the share of road space taken by private cars (as suggested above, for transporting 10-20% of passengers, they should only be given 10-20% of total road space, including parking), various measures could be taken: banning them from lanes/small streets, banning them from the most congested parts of the city, enforcing bans on streetside parking on major streets and parking on footpaths, charging for parking in all other places, raising import taxes, and restricting licenses.

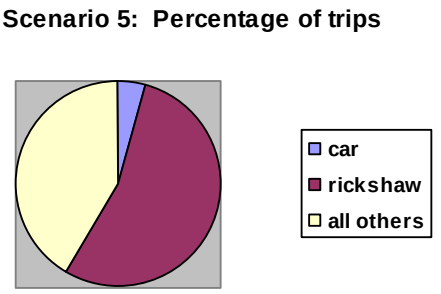
What would be the result of an increase in travel by bus and bicycle, continuation of many trips by rickshaws, and a decrease in private cars, as shown in Table 6, Scenario 5? In this scenario, we increase the use of those vehicles that take up small amounts of road space relative to the number of passengers they transport.

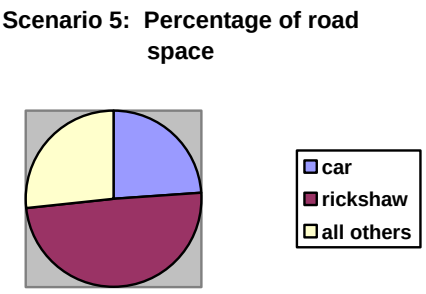
**Table 6. Scenario 5: Percentage of vehicular passengers travelling by car halves; bicycle and bus increase**

| Mode | Vehicular Modal Share | % Vehicle | % of Road Space |
|---|---|---|---|
| Car | **4.36** | 6.61 | **23.81** |
| Baby taxi | 3.98 | 4.12 | 12.15 |
| Bicycle | **4.71** | 10.71 | **3.85** |
| Bus | **30.21** | 1.32 | **8.56** |
| Rickshaw | 53.90 | 76.60 | 49.63 |
| Tempo | 2.83 | 0.63 | 2.00 |
| Pedestrian | | | |
| Total | 100.00 | 100.00 | 100.00 |




The balance between bicycle and rickshaw travel will be dependent partly on road conditions, but it must also be acknowledged that not everyone will be willing or able to cycle (including small children, the ill, the elderly, and in the current situation, women), and that extremely hot and rainy weather are likely to keep cycling low for parts of the year. Here, we put cycling at almost twice the 1997 rate, which is lower but much more realistic rate than that presented in Scenario 4, with cycles accounting for less than 5% of vehicular movement. Bus use is also lower than in Scenario 4, at "only" 30% of vehicular passengers, and rickshaws are restored to almost 54%, as was the case in 1997. We have slightly decreased car use from Scenario 4, down to just 4.4%. This means that cars take up "only" 23.8% of road space (requiring over 5 times as much road space as the passengers they move).




In this scenario, we see somewhat more even distribution of road space per passengers moved, though baby taxis and cars continue to take up disproportionate amounts of space. Increases in bus services mean better mobility for many, while continuation/increase in rickshaws/bicycles, and a decrease in cars, mean a pleasanter environment for those walking; more people walking would lessen the burden on vehicular transport. This scenario would require only **84%** of the road space needed in 1997—again reducing congestion by reducing private car use while ensuring mobility for the majority. (Speed is not an issue, as walking, rickshaws and cycles would mainly be used for short trips, and buses for longer journeys.)

In order to prevent rickshaws from slowing down motorized vehicles, rather than removing rickshaws from the streets, we could separate motorized and non-motorized transport. In doing so, priority for road space should be given to non-motorized transport and buses.

We would further argue that provision must be made for non-motorized transport on *all* of Dhaka's streets. Why would the plan of relegating rickshaws to minor roads fail? First, there are many routes currently unserved or underserved by buses. It would be extremely expensive and burdensome to attempt to provide bus service for all travel throughout the city, and it is unreasonable to expect people to wait for long periods in order to travel short distances. Second, much short-distance travel is along major streets. As pointed out above, buses cannot meet this need, and walking along heavily-motorized roads is too unpleasant to allow for significant increases in pedestrian volume. Finally, again, it is inefficient to burn fuel (thus creating air pollution and continuing our reliance on foreign oil, or further depleting our stock of CNG) in order to move passengers short distances, regardless of which road it be.

Motorized transport also wastes road space, and space within buses that should be saved for those travelling farther. If those going short distances walked, cycled, or took rickshaws, those travelling farther would have shorter waiting periods, and buses would be used more efficiently—making fewer stops, long-distance travellers would arrive much faster, and less fuel would be wasted. Our major roads are sufficiently wide to allow for a mix of non-motorized transport (NMT) and motorized transport (MT).

A similar provision is unnecessary, and would in fact be harmful, as regards motorized vehicles. Narrow streets and lanes are inappropriate for motorized vehicles, which quickly block up a lane otherwise easily used by hundreds of NMT passengers; allowing only non-motorized vehicles would greatly improve air quality,

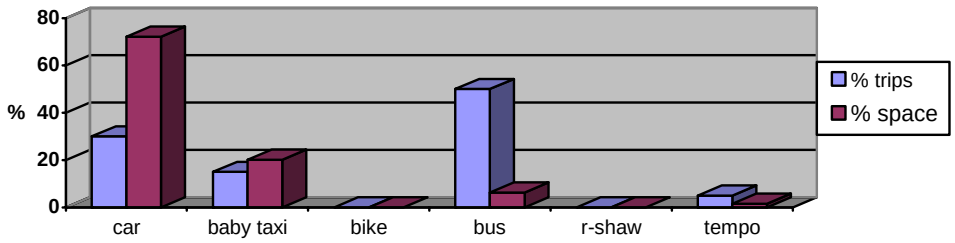
reduce noise, increase safety, and allow the residents and workers of the area to take back the streets—to sit outside, to let their children walk about unsupervised, even to play on quiet lanes.

Some people say that the traffic jams on VIP roads are *still* the fault of rickshaws remaining on *other* roads (where traffic moves fairly freely). What then if there were no non-motorized transport in all of Dhaka, except walking? In Table 8, Scenario 7, we ban all non-motorized vehicles and retain only motorized ones.

**Table 7. Scenario 6: All MT, no NMT**

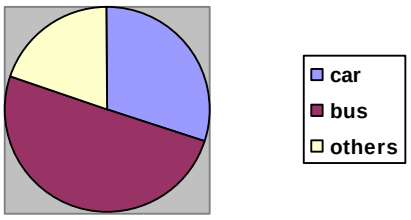
| Mode | Vehicular Modal Share | % Vehicle | % of Road Space |
|---|---|---|---|
| Car | 30.00 | 70.75 | 72.06 |
| Baby taxi | 15.00 | 24.12 | 20.15 |
| Bicycle | 0.00 | 0.00 | 0.00 |
| Bus | 50.00 | 3.40 | 6.24 |
| Rickshaw | 0.00 | 0.00 | 0.00 |
| Tempo | 5.00 | 1.73 | 1.55 |
| Pedestrian | | | |
| Total | 100.00 | 100.00 | 100.00 |

**Scenario 6: All MT, no NMT**

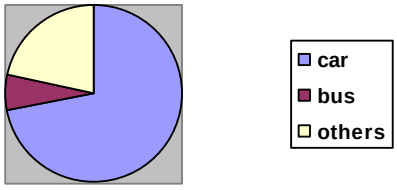



In this scenario, cars gain what many consider to be their rightful place, being the main vehicle on the street, followed by baby taxis (cars for the middle class) and buses. Under this scenario, road space would have to **triple** from the 1997 scenario (**296%**). No matter, we would all be dead from asthma before the increased expenditure killed us.

**Scenario 6: Percentage of trips**



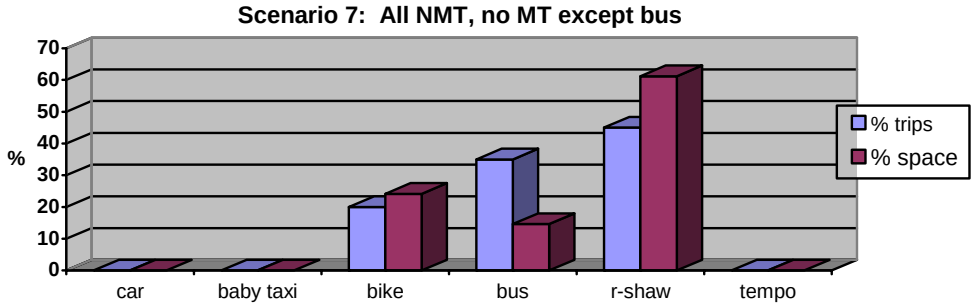

**Scenario 6: Percentage of road space**



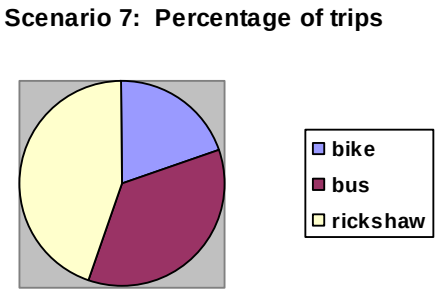
Again, purely for the sake of demonstration, in Table 8 we present Scenario 7, wherein we eliminate all motorized vehicles except buses.

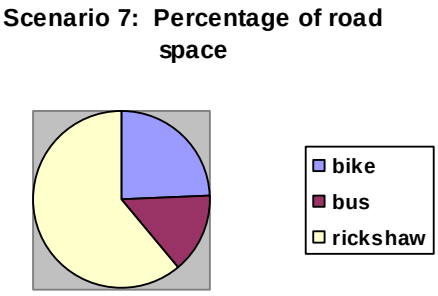
**Table 8. Scenario 7: All NMT, no MT except bus**

| Mode | Vehicular Modal Share | % Vehicle | % of Road Space |
|---|---|---|---|
| Car | 0.00 | 0.00 | 0.00 |
| Baby taxi | 0.00 | 0.00 | 0.00 |
| Bicycle | 20.00 | 40.99 | 24.17 |
| Bus | 35.00 | 1.38 | 14.64 |
| Rickshaw | 45.00 | 57.64 | 61.19 |
| Tempo | 0.00 | 0.00 | 0.00 |
| Pedestrian | | | |
| Total | 100.00 | 100.00 | 100.00 |




Rickshaws would again be the main vehicle, followed closely by bicycles. Rickshaws here account for 45% of trips, buses for 35%, and cycles for 20%. With the quieter, safer streets, there would also probably be a great increase in walking over Scenario 7. This purely theoretical scenario would require only half (51%) of the road space needed in 1997; all the more space to plant trees and shade our bicyclists and pedestrians, and create play spaces for children.

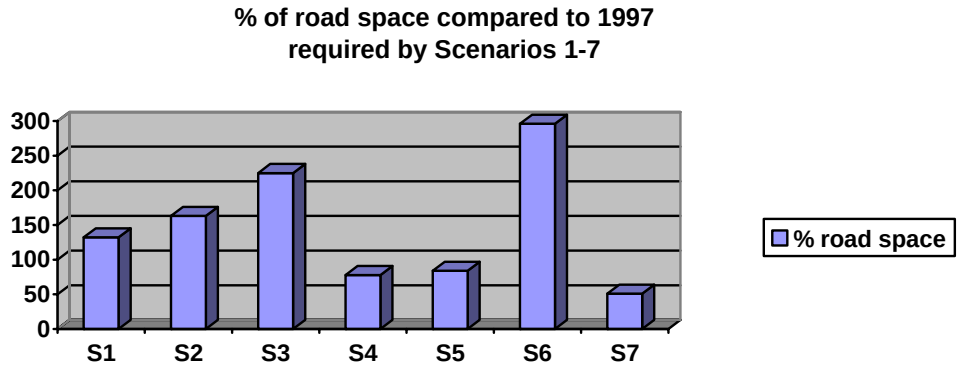


Clearly, in terms of space requirements, encouraging private cars and discouraging rickshaws will simply lead to a demand for bigger, wider, and more streets; we could actually *increase* the amount of road space available simply by reducing private car use and creating better conditions for NMT.

We have not factored in parking when we calculate space required per vehicle. Yet cars require a huge amount of space not just in the streets when they move, but also when they are at rest—often taking up one entire lane that could be used for NMT, and in many cases also blocking the footpath, thus forcing pedestrians into the street. Creating more parking spaces is not an option—it simply means further subsidizing private car use (all of us pay for the space, while the driver parks there for free). Space is extremely limited and valuable in Dhaka. Why waste it on parking when it could support other uses? The ground floor of buildings could be used for housing, not parking; more shopping space would be available in malls if they did not provide parking; more room would be available for pedestrians and vendors on footpaths, and for rickshaws and bicycles on the street, if cars were not parked there. A disturbing trend is that of using fields and parks for parking, which *should* offer much-needed play areas for children and relaxation spots for adults.

As shown, the different scenarios presented above have widely different space requirements. As cars increase, more and more space is needed—in comparison with the situation in 1997, having the number of cars double and rickshaws decline (Scenario 1) would require 132% as much space as was needed in 1997; having the number of cars triple and rickshaws decline (Scenarios 2 and 3) would require 163%-225% as much space. If cars were halved and bicycles and buses increased (Scenarios 4 and 5), only 78-84% as much space would be needed (thereby likely *decreasing* traffic jams). If only motorized transport were allowed (Scenario 6), almost three times (296%) more space would be needed than in 1997; if only bicycles, buses, and rickshaws were allowed (Scenario 7), only 51% of 1997 space would be needed.




*Note: Space requirements do not include parking, nor take into account the growing size of many private cars in Dhaka. The space requirements of the MT-dominant scenarios are thus an* ***underestimate****.*

The choice is ours. We can kill ourselves with noise and fumes, increase the sense of hostility and ugly competition on our roads, and bury ourselves in cement and asphalt.

Or we can modify our city so as to have optimal mobility at a low economic price, with clean air, peace and quiet, and some other benefits: employment sustained for the very poor, more space for trees and children's play that otherwise would be used for cars and parking, and a friendlier, safer city with more opportunities for human interaction. Which will we choose?

**Whose Employment is Unnecessary?**

Rickshaws provide employment to the poorest sector of society: uneducated men with no other saleable skills. Their employment not only supports the rickshaw pullers and their families, but also a whole series of others dependent on them: those who repair rickshaws, street vendors who sell pullers food and tea, and villagers whose entire economy is dependent on the money sent home by the rickshaw pullers.

Some people say that we should not make transport decisions based on concern for the poorest. Some say that rickshaw pullers should return to the countryside and make a living somehow off their land. Some imply that alternate employment is available.

We question these facile assumptions. Should we make our transport decisions based only on the needs and desires of the richest? Should we ignore our environment, people's health, and quality of life? Or should we not accommodate as many people as possible: providing employment to the poorest, improving the environment and thus health through promotion of non-polluting vehicles, giving options to the poor by making cycling safer and buses more available; and ensuring that women, children, and the elderly still have access to door-to-door transport?

It may be easy for those who are employed to say that jobs are unnecessary for others; easy for those of us living in the city to tell the poor to return to the countryside. The truth is that as jobs decline, people suffer: children go hungry, and desperate people turn to begging and crime. The bigger the gap between rich and poor, the more crime occurs. Ensuring—or at least not deliberately reducing—jobs for the poor helps reduce that gap and stabilize societies. It is not wrong to take the poor into account in our decision-making; it is wrong *not* to do so.

<u>Recommendations</u>

Dhaka's transport situation must be addressed while taking into account other issues; transport does not exist in a vacuum, divorced from other parts of life. It is not sufficient to improve Dhaka's transport system while disregarding our air quality, levels of noise pollution (already unacceptably high in most of the city), economic situation, and quality of life. Ideally—and quite practically—we can improve the mobility of the majority of Dhaka's residents, while also *improving* our environment and quality of life.

How is this possible? Quite simply, we must reduce our economically, socially, and environmentally unaffordable dependence on private cars. We can do this by discouraging the use of private cars through a range of measures, reducing the need for lengthy trips by better mixing our neighbourhoods (keeping polluting industries

out of the city but creating a mix of residences, offices, schools, health clinics, shops, restaurants, etc. throughout the city), and encouraging modes of transport that are efficient in their use of space per passengers moved and that do not pollute (a mix of public transit and non-motorized transport).

It is not appropriate to set the official legal number of rickshaws at 89,000 arbitrarily, without any scientific basis. According to two studies on rickshaws[26] [27], they are very efficient economically and have been operating under long-term marginal equilibrium conditions. This implies that as far as economic efficiency is concerned, the numbers of rickshaws are optimal, be it legal or illegal. There is no need to control their number. Any sub-optimum number may promote corruption, monopolies or even unfair fare regimes. As mentioned earlier, some modal shift from rickshaws to a more efficient mode of transport like bicycles and buses may be desirable. (It is also important to remember that no matter how much bus services improve, buses—like cars, and as opposed to bicycles and rickshaws—will still create air pollution and be the source of serious accidents and injury.) However, any control on the number of rickshaws has to be implemented on the basis of sound traffic management strategies, not by administrative force.

As regards an appropriate mix of different types of NMT, rickshaws should continue to play their due role, as they are more efficient in comparison to their motorized counterparts for short trips, and often more convenient than walking or cycling. While rickshaw pullers represent the most underprivileged section of the society—and a reduction on rickshaws thus means a direct attack on the ability of the poorest to survive and to feed their children—rickshaw passengers mainly come from the middle class, who, according to HDRC's report, do not perceive rickshaw fares to be high. Rickshaws benefit the middle class through the transport they provide, and benefit the poor through providing jobs. While rickshaws must be maintained, promotion of other NMT is also important. Specifically, introduction of an uninterrupted network for bicycles could significantly improve people's mobility.

The modal share of pedestrians is very high (63%), indicating that many people cannot afford any form of transport. This includes the very marginal sections of the society like daily labourers, garment workers and other underprivileged people. A cycle-friendly transport system could induce modal shift from walking to cycling, and thus provide basic transport needs to these disadvantaged people who have been deprived of their fundamental rights for so long. This could have far reaching positive impacts on mobility and economic regeneration. Meanwhile, rickshaws would still play an important role in transporting those unable or unwilling to bicycle, which includes the elderly, the very young, the infirm—and at the moment, given the unacceptability of cycling by females, women.

Past measures to control or improve traffic have focused exclusively on motor vehicles. Road dividers are sometimes unbroken for long distances, causing cyclists

[26] BCEOM Fence Engineering Consultants, Development Design Consultants, IT Transport, Kranti Associates, and Resource Planning and Management Consultants (1995) "Bangladesh Rural Roads and Markets Improvement Project II (Draft Final Report)", Report prepared on behalf of Local Government Engineering Depart (LGED), Government of the People's Republic of Bangladesh.

[27] Bari, M.M. (2000) "Quantification of the Effects of Non-motorised Transport and Roadside Activities", Ph.D. Thesis, School of Civil Engineering, University of Birmingham, UK.

and rickshaw-pullers to make detours of up to a mile. When rickshaw lanes have been created, they have been quite narrow, despite rickshaws being the major source of transport. While many strategies have been used to reduce rickshaws—including destroying those without a license, banning them from major roads, and preventing them from parking in many areas—no similar efforts have been made as regards cars, which are free to drive, and park without cost, almost everywhere. Private cars can drive in small lanes, and can park on footpaths and on major roads, thereby blocking all other vehicles, including other cars. This imbalance needs to be addressed. Transport solutions must benefit the majority, our environment, our health, and our economy.

> "In all respects—economic efficiency, space consumption, and availability to the population—the car is the worst form of transport on Dhaka's streets."
>
> *--Gallagher*

Through a change in infrastructure and a reversal of the current propaganda campaign being carried out against non-motorized transport, we could see a vast improvement in the quality of life in Dhaka, accompanied by a cleaner and quieter environment, greater mobility for the masses, fewer serious accidents, more sociable neighbourhoods, less crime, and tremendous savings in money at the household and national level.

* * *

## Private Cars: As Good As We Believe?

We have come to accept cars as a necessity, as well as a benefit. But it is time for some critical thinking on this point. What do we gain from cars and what is the cost of those gains? Are we gaining what we anticipated?

We expect that cars will provide us with speed, comfort, privacy, safety and convenience. We will easily move from destination to destination. What is the reality?

| **Myth** | **Fact** | **Costs** |
|---|---|---|
| Motorized transport (MT) is fast. | MT often gets stuck in traffic jams and at traffic signals, and thus may be as slow as bicycles, or worse. No big city in the world, regardless of not having non-motorized transport, is free of traffic jams. The more private cars, the worse the jams. | While sitting in traffic jams, motorized vehicles emit fumes, burn fuel, and contribute to noise pollution. |
| Cars are comfortable. | Somewhat—but this must be balanced by the hassle of traffic jams, and the discomfort to those on the street (not in cars). | For pedestrians, bicyclists, and those living on or near major roads: noise, smell, lack of safety, lack of mobility for children and elderly. Also high cost of car |

| | | |
|---|---|---|
| | | ownership and maintenance for those who have them—over $8,400/year in the US. |
| Cars offer privacy. | True—so much so, people travelling in cars are removed from the life on the streets. | Disruption of social fabric: people don't know their neighbours, little interaction with strangers on streets, children forced to stay indoors rather than play outside. |
| Cars are safe. | Cars are highly dangerous, killing thousands of people every year, including passengers (who at least gain the benefits of car use) and pedestrians (who don't). | About 300,000 *children* die each year around the world in road crashes. Car crashes were the 9th cause of death worldwide in 1990, but are expected to become the third cause by 2020. On average, one hospital bed in ten is occupied by a road crash victim. |
| Cars are convenient. | Cars provide door-to-door service in (almost) all kinds of weather; as a result, people fail to walk, and thus become overweight, unfit, and easily fall prey to a range of serious diseases that would be avoided if they walked more. | Cars destroy the convenience of others, slowing buses, making walking and cycling dangerous and unpleasant, and making cities noisy, smelly, and unsafe. |
| Cars are glamorous/symbols of status. | In the minds of many, a car means status; the more expensive the car, the more people will respect the owner. This is a sad statement of values: would we respect a rich criminal more than a poor teacher or social worker? | Cars are extremely expensive, and most of that expense is paid by the government and taxpayers, regardless of whether they own cars: building and repairing of roads, highways, flyovers; subsidy of fuel prices, and provision of free parking. |
| Cars are modern and sophisticated, and the preferred mode of transport worldwide; rickshaws are outdated. | Throughout the world, including Europe, city planners are reducing road and parking spaces for cars and prioritizing public transport, cycling and walking to deal with the innumerable problems caused by cars. Cycle rickshaws ("pedicabs") are now being used in many European and American cities to transport both passengers | Air pollution, noise pollution, global warming, traffic jams, dedication of space to cars rather than people, and urban isolation are also "modern"—modern blights. The costs of the dream of car ownership are no longer affordable to most cities. |

| | | |
|---|---|---|
| | and goods. | |
| Rickshaws, not cars, cause traffic jams. | Cars take up a huge amount of space, often to move only one passenger. In large cities, when factoring in stopping at traffic lights and in traffic jams, travel time *per distance* may be no or little greater for motorized than for non-motorized transport. Rickshaws take up relatively little space, are easily manoeuvrable, and are not necessarily slower than cars. If rickshaws were responsible, why would rickshaw-free roads, and cities without rickshaws, still have traffic jams? | Encouraging people to drive rather than take rickshaws means more traffic jams, more noise, more air pollution, and more loss of jobs for the most poor and vulnerable. No matter how many roads we build, there will never be enough space to meet the demand by private cars. The only solution is to limit the number of cars, and prioritize road space for buses, bicycles, and rickshaws. This will virtually eliminate traffic jams and vastly clean our air and make our city quieter and safer. |
| Technology will solve our problems. | At best, technology will help with waste of fuel and with passenger deaths. Technology does almost nothing to reduce traffic jams; the only thing that *is* successful is reducing road space, which discourages people from driving. Technology cannot solve the other many problems caused by cars. | Technology causes as well as solves problems. The invention of cars has brought us endless problems; the simple technology of biking (and even simpler of walking) would solve many of those brought us by cars. |
| Cars are inevitable; we can't eliminate them. | In roughly 20-50 years, so little oil will be left in the world that it will be too expensive for almost anyone to buy; our supply of natural gas is likely to run out far sooner. We will have no choice but to switch to other forms of transport. The problem of global warming suggests that the change needs to come long before fuel supplies run out. | By accepting private cars in great numbers, we are not allowing road space for buses, ambulances, or other modes of transport; we are not allowing children, the elderly, or those without cars to move about freely; cars in fact create far more problems than they solve. |

These ideas are new and difficult to accept at first, but if we think about the issue and examine our prejudices, we will see that we have been accepting many myths which are not only not true, but are harming our way of life. We can't hear each other talk; we can't breathe the air; children can't play in the streets or even on the sidewalks, and rely on their parents for transport rather than gaining independence and mobility at young ages; the elderly are prisoners in their homes or terrified when they move

about; we don’t talk to our neighbours; we are killing thousands of people each year; and we are still unable to move about easily in the streets!

When the cure is worse than the disease, it is time to seek different treatment. Private cars are only making our problems worse. We must look somewhere else—at public transport and non-motorized transport—for the solution to our mobility woes.

## Reducing Traffic Jams: Our Perspective

As everyone knows, Dhaka suffers from terrible traffic jams. One suggestion for reducing traffic jams has been to ban rickshaws from major streets, and rickshaws have indeed been banned from several streets already. Flyovers are also being built. Yet neither of these measures has helped in reducing traffic jams. In fact, the police commissioner is quoted in the newspaper as saying that the Mohakhali flyover will only increase traffic jams (Janakantha, 9 October 2004).

What is the real cause of traffic jams? What is the solution?
The real cause of traffic jams is private cars. The number of private cars is increasing in Dhaka everyday, and the streets are jammed with private cars. Yet few people travel by private car, and few are likely to be able to do so in the future, when we consider low income of most Dhaka residents, lack of space for cars, the tremendous population density and crowdedness of the city, and future problems obtaining fuel as prices rise and worldwide scarcity set in.

We often see only one to three passengers in a private car; in fact, often there are no passengers, but just the driver going to pick someone up or returning from dropping someone off. This is an outrageous amount of space to take for the sake of moving so few people.

The most efficient way to travel short distances is by rickshaw, cycle, or foot; the most efficient way to travel longer distances is by bus or other public transport. Many people travel together on one bus, thus taking up relatively little road space. The amount of space taken in the street by one bus takes less space than three cars, when we consider the space that is maintained between moving vehicles. Meanwhile, one bus can carry as many passengers as 15-20 private cars. On one stretch of road, within an hour 2,000 cars can pass, carrying possibly 3,000 passengers; meanwhile, a bus or train could carry 40,000 people an hour in the same amount of space.

A normal-sized private car (in other words, not a van, or SUV, or CRV) requires about 200 times more space to park, and from 400 to 4,000 times the space to drive, as a person requires to stand and to walk. Quite simply, the inordinate space demands of cars has meant that our destinations have moved further and further apart, as more and more land is used to accommodate cars. The more parking we build, and the wider we make our roads, the further apart our destinations will be…and the more we will need cars to reach them, thus increasing the space demand of cars, and the need for more parking and wider roads.

Let us not forget about parking requirements. In America, there are on average eight parking spaces for each car: at home, at the office, at restaurants, shops, movie theaters, other offices, etc. When cars park in the street, they take up space that could be used by other vehicles; when they park in parking lots, the parking lot itself is taking up space that could be used to generate income through any number of enterprises. Parking is simply a waste of space; less parking would encourage people to drive less, and would thus help reduce traffic jams.

Do rickshaws cause traffic jams?

Many people think that banning rickshaws from major roads will reduce traffic jams, and under that theory, rickshaws have indeed been banned from various roads, most recently on Mirpur Road from Russell Square to Azimpur on 17 December 2004. But do rickshaws actually cause traffic jams?

In Jakarta, rickshaws were banned to reduce traffic jams. As a result, private cars increased—and so did traffic jams. All non-motorized traffic is banned from Shabagh to Mohakhali via Farmgate. Yet this street suffers from some of the worst traffic jams in Dhaka.

For the amount of space they take on the road, rickshaws carry twice as many passengers as private cars. In addition, nobody travels unnecessarily by rickshaw. Rickshaws do not require additional space for parking. While one rickshaw carries many passengers throughout the day, a private car may carry very few, and spend much of its time simply taking up space while parked here and there.

Dhaka has many narrow streets and lanes, for which rickshaws and bicycles are the most suitable forms of transport. On such narrow lanes, rickshaws can easily travel in both directions, still leaving room for people to walk on the sides of the road. But if just one car enters the street, a traffic jam immediately occurs, causing delays and inconvenience to the hundreds of rickshaw passengers who otherwise were traveling smoothly and easily.

**The advantages of rickshaws**

Given the crowded conditions of Dhaka's roads, when total trip time is considered, motorized transport has little advantage in speed over non-motorized. In addition, unlike motorized vehicles, when rickshaws are caught in traffic jams they emit no air pollution, waste no fuel, and make no noise.

Rickshaws are the most efficient way to move people or goods for short to medium distances. According to UN-ESCAP, 70% of trips in Dhaka are under 2 kilometers long. For such trips, walking, cycling, and rickshaws are very appropriate, as they waste no fuel, create no air or noise pollution, and take very little time. It is a waste to use a car for such a short distance, and the

waiting time for buses makes the trip potentially take far longer than it would by rickshaw or other means.

The best transport for women, small children and the elderly is rickshaws. When rickshaws are banned, it is these groups who suffer the most. In addition, many poor people derive their employment from pedaling rickshaws. This benefits not only the pullers, but their families. One survey shows that 5 million people throughout the country are dependent on rickshaw pullers for their livelihood.

**International experience**

What happens when crowded cities attempt to reduce their traffic problems by building more roads, and/or widening existing ones? In large cities around the world, the same experience is repeated: more space for cars causes more people to drive more. While initially the traffic jams are reduced, soon the increase in the number of cars, and the distance individuals travel, compensates for the added space, and traffic jams are at least as bad as they originally were.

It is simply not possible to build enough road space to meet the demand for driving. After all, consider how we expand road space. It is necessary to destroy some buildings in order to build new roads: thus destinations move farther away, and people must travel farther to get to the same places. By banning rickshaws, some people will shift to private cars, which take up more space. In short, it is not possible to solve traffic jams—and nowhere has it succeeded—by expanding road space for cars.

Three of the worst cities in the world for traffic jams are Bangkok, Jakarta and Los Angeles. There are no rickshaws or other non-motorized transport in any of them (the few bicycles in Bangkok, for instance, mostly ride on the footpaths). They also devote tremendous resources to road building—but their traffic jams persist, or worsen, because the number of private cars increases so much faster than any increase in road space can.

The use of space for parking and the movement of cars can take extreme dimensions. In Houston (Texas) and Los Angeles, up to 70% of space downtown is used for cars. That leaves a mere 30% for everything else that one would wish to have happen in the downtown—meaning that buildings are widely spaced and surrounded by parking lots, creating an unsuitable atmosphere for walking, and thus forcing everyone to drive, which in turn demands more space.

Up to 30% of morning traffic in some cities in the US consists of parents driving their children to school—even for very short trips. Not only does this create terrible traffic jams, but it makes it dangerous for every child on foot or on bicycle, with 50% of accidents happening to them being caused by the

parents of other children driving to school. In Dhaka, if parents sent their children to school by rickshaw van, or took them by cycle or foot, this would greatly reduce the otherwise terrible traffic jams that daily occur in front of schools.

On average, residents of Bangkok waste the equivalent of 44 working days stuck in traffic. Every day, $1.4 million dollars of fuel is wasted by cars idling in traffic in Bangkok.

In Singapore, Hong Kong and Tokyo, most trips are by metro (train). In wealthy cities of Europe, most people travel to work by train or bicycle. In Tokyo, train stations provide ample cycle parking, so that most commuters travel to the train station by bicycle, not by car. Policies to reduce private cars, such as limiting the number of licenses issued and maintaining a very high tax on fuel, helps keep the use of cars low, and thus to reduce traffic jams successfully.

Bicycles have long been the main form of transport in China. While they continue to be so in smaller cities and the countryside, large cities have seen a huge increase in the number of private cars—and thus a huge increase in traffic jams. Beijing in particular is paralyzed by the dual problems of traffic jams, and difficulties in obtaining sufficient fuel to maintain its large fleet of motorized vehicles.

Bicycles are a popular form of transport in many European cities. In Holland, 83% of children travel by bicycle to school, thus enjoying freedom, much-needed exercise, and independence, all of which are so lacking in Dhaka's middle- and upper-class children. Dhaka appears more intent to follow London's destructive model. Since there are so many cars on the streets of London, few children can travel by bicycle. Meanwhile, the speed of cars in modern-day downtown London is no greater than that of horse-drawn carriages a century ago.

It is a common belief that if only fast-moving vehicles are allowed on the roads, then traffic jams will decrease. But the faster vehicles move, the more space (headway) that is needed between each vehicle. Thus fast-moving vehicles can only move a relatively small number of people in a given amount of space. In any case, as mentioned elsewhere, it is very difficult to achieve high speeds in any densely-populated city like Dhaka; cars are often reduced to a crawl, making them no faster than non-motorized transport, but far more wasteful.

When people own cars, they tend to use them unnecessarily, even for short trips that could easily be made by foot. When people must pay for each trip they take, they are far more likely to avoid unnecessary travel—for instance, by choosing to shop nearby, or send children to a neighborhood school.

Since it doesn't work to increase the amount of road space for cars, what does work? A number of measures have proven effective, including creating more diverse mixes of use in each neighborhood and thus cutting down on longer-distance travel; promoting public transport by for instance creating bus-only lanes and thus speeding bus travel relative to car; and improving conditions for non-motorized transport, including walking. In various cities in Europe, America, Canada, Hong Kong and Singapore, road space for cars has actually been *decreased*. This has happened through allowing more space for buses and bicycles, by increasing the size of footpaths, and planting more trees along roads. As a result, fewer people choose to drive, and traffic jams actually decrease. This phenomenon is known as *traffic evaporation*.

Although it may seem counter-intuitive at first, that less road space would actually decrease traffic jams, on further reflection it makes good sense. When there are plenty of roads and good conditions for driving, people drive more; when conditions for driving deteriorate, people seek alternatives. It is important to encourage the seeking of alternatives, and improve the alternatives, at the same time as discouraging movement by private car.

Imagine if each section of Dhaka contained a mix of workplaces, residences, schools, shops, restaurants, etc. With the shorter travel distance to destinations, more people could travel by foot or bicycle. If simultaneously roads were narrowed, people would rapidly discover that they only waste time by driving, and more people would choose to walk or cycle. If a good system of public transport (bus, possibly metro) existed to go farther, people would never need to drive. Traffic jams would decrease significantly, children would be able to play outdoors and to enjoy more freedom of movement, air and noise pollution would decline, and our streets would be safer both in terms of fewer accidents and, thanks to so many people being outdoors, less crime. Our city would also be friendlier, as more people interacted with others. We would gain far more space for people's various needs, as very little space was given to the movement and parking of cars. It is just such a model that people are currently trying to create in different cities around the world—and just such a model that we should seriously consider for Dhaka.

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