

## Mobility

### Solutions for a sustainable transport future

Fewer, shorter trips, greater use of public transport, and maximising the number of walking and bicycle trips. This agenda should guide the development of our cities and streets, says **Dinesh Mohan**



*Promoting public transport reduces overall emissions, gridlock and vehicle dependence.* PHOTO: R.V. MOORTHY

**F**or hundreds of thousands of years, consumption patterns were limited by the amount of manual labour that people could spend on what they wanted to consume. This decided their travel needs, the size of their houses and tools they could make. This put a limit on the use of natural resources.

The industrial revolution changed all that. Machines could now be used for harnessing enormous amounts of energy to make everything they wanted – from large houses to every kind of consumer good. This obviously redefined need and greed. The world got transformed in a manner that the rich and powerful could use up huge amounts of energy to transform natural resources into objects of daily use, travel and ultimately weapons of mass destruction. The world view

changed into a belief that there were infinite resources to be tapped, and that science and technology would have solutions to every emerging problem without constraint. It was only a matter of time, and there need not be any limits to consumption.

This world view was challenged all along by Luddites, some religious leaders, moralists, and Mahatma Gandhi in our own country. They were all ignored. The first major challenge to this world view was put forth by the Club of Rome in their report *Limits to Growth* and they predicted an end to resources in the early 21st century.

This the majority of economists and scientists disbelieved and to their relief many of the predictions have not come through. But the threat has now come to the fore in another form, as the



*Investments in modern air-conditioned buses will attract new riders and help the environment. An air-conditioned bus only adds half a rupee a trip over its lifetime. PHOTO: M. KARUNAKARAN*

report of the Intergovernmental Panel on Climate Change (IPCC) issued last year makes clear. This report warns us that warming of the earth is inescapable and all we can do is to mitigate its effects by restricting the heating of the earth by two degrees Celsius in the next 50 years.

The predictions are that if we don't do so the earth will see horrendous disasters affecting humanity. This time the warning has been taken somewhat seriously as evidenced by the award of the Nobel Prize. Most scientists and economists have fallen in line though faith in technology still remains supreme.

These attitudes are even more dominant in the domain of transport. Transportation planning and road safety policies (TPRSP) have generally relied on the most simplistic applications of the "technology solves all" paradigm. The heady experience of speed starting in the late 19th century has dominated all TPRSP thinking. Human be-

ings had not experienced comfortable speeds greater than 5 km an hour for half a million years of their existence, except in their dreams.

The launch of the motor car and the airplane in the early 20th century changed all that. We became speed addicts, and like any other addict modified all TPRSP to ensure availability of speed and long distance travel.

Scientific theories and models taught all over the world for a century assumed that the only objective of TPRSP was to ensure smooth and unlimited movement of cars, and if there were any "unintended" effects like deaths, diseases and destruction of living patterns (called externalities by economists) they could be resolved by greater application of technology.

In the late 20th century we were alarmed by the effects of vehicular pollution, but improvements to fuel efficiency and reduction in vehicle emissions through technological interventions

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lulled us into business-as-usual planning. The recently released WHO World Report on Road Traffic Injury has heightened concerns regarding road safety. But it has not really alarmed us into rethinking the current transportation paradigm to take care of the millions of deaths and disabilities caused annually by road traffic. However, the IPCC Report has forced many around the world to rethink our options, but not too many.

### Implications of IPCC report

The implications of the IPCC report are at one level very simple – if the human race is to survive it has to limit CO<sub>2</sub> emissions in a very short time frame. This means that developed countries have to reduce their CO<sub>2</sub> emissions by more than 60 per cent in the next 40 years, and India cannot increase its average emissions more than two or three fold. Both goals are very difficult to attain. For us in India, it means that while the poorer sections of the population may increase their consumption to reach “comfortable” living norms, the richest in India (read car owners) will have to reduce their CO<sub>2</sub> emissions like the Europeans. This will have to form the base of our sustainable transport policies for the near and long term future.

What does sustainable TPRSP mean for us? At a fundamental level it requires less energy consumption. The choices available are: low emission vehicles, alternative fuels, fewer trips, shorter trips, greater use of public transport instead of private vehicles, and maximising the number of walking and bicycle trips.

Obviously, all options will have to be pursued for maximum gain. But, we will have to establish priorities on our political agenda as the shift is not going to be easy or painless, both socially and technologically. Let us examine each option briefly here.

At present our policy makers are putting the maximum stress on low emission vehicles and alternative fuels. This is horribly short-sighted. For the next 20 years there is no hope of huge reductions in CO<sub>2</sub> primarily through low emission vehicles because the small gains will be more than offset by the rising number of vehicles and longer

trips. We know that as fuel consumption reduces people travel more and end up using more fuel. Alternate fuels also don't give us much CO<sub>2</sub> respite. Gasohol may reduce pollution a bit, but not CO<sub>2</sub>, especially if alcohol is produced by burning bagasse.

### Biofuels not a solution

Production of biofuels has already become controversial internationally because of rising food prices. In a food and water short India this is going to be even more difficult.

Most international experts do not see biofuels as a solution in India. Even vehicles driven on electricity are not CO<sub>2</sub> efficient because thermally produced electricity produces more CO<sub>2</sub> (including transmission losses, etc.) than diesel/petrol-powered vehicles. And, this does not include the negative effects of the huge amounts of fly ash associated with electric power. Even in public transport an efficiently run bus system produces about half to two-thirds the CO<sub>2</sub> per passenger than that in a metro rail system. This is not to suggest that we should not have low emission vehicles. We must, and sooner rather than later. But, it

will not be the mainstay for a sustainable transport system.

Fewer trips, shorter trips, more use of public transport instead of private vehicles, and maximising the number of walking and bicycle trips has to be the priority, and it has a lot to do with how we develop our cities and streets. Now we know that no matter how many roads we build and how wide they are they always get filled with vehicles.

The number of vehicles people own is always more than road space available, as evidenced by road conditions in the small towns of India to car and road-based cities like Los Angeles in the U.S. Therefore, vehicle emissions in a city are directly proportional to road space. The higher the percentage of road space and more the number of elevated transportation corridors in a city, the more the pollution and CO<sub>2</sub> emissions. This also applies to one-way and signal free roads.

These roads force people to travel longer distances and keep their vehicles on roads for longer times. For example, my neighbour used to get out

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*Pathways for bicycles have been removed in most cities. A progressive policy should aim to make cycling safer and easier.* PHOTO: K. GOPINATHAN

of his house, turn right on the main road and go 2 km to his office. Now all the turns have been blocked, he has to turn left, go 2 km to the next major junction and then make a U-turn to travel 4 km more to his office. Instead of 2 km, now his daily office trip is 6 km!

Public transport will only be used by choice if it is safe to walk and cross the road to take the bus. Provision of very safe roads then becomes a prerequisite for promoting public transport and hence cleaner air. In a hot country the access trip to the bus must be less than 5 to 10 minutes away, or less than 500 m and all buses air conditioned. An air-conditioned bus only adds half a rupee a trip over its lifetime. This means that no city block can be more than 800 m to 1 km square. At present many of our colonies and gated communities are larger than that. This discourages public transport use.

The short walk must be safe from crime also. This can be ensured only if there are shops and street vendors on the road. So mixed land use, and intensely so, becomes imperative.

How do we ensure fewer and shorter trips? It is the poor who are forced to have few and short trips, and this should be enabled by policy. Poor neighbourhoods should exist cheek-by-jowl with

rich colonies and all should be less than a kilometre square in area. Small shops, restaurants, hospitals and businesses would then have to be an integral part of residential areas.

If the above conditions are met, a city can have dedicated bus and bicycle lanes on all major roads. A typical arterial road being two car lanes, one dedicated bus and bicycle lane each, a two metre pedestrian path and a one metre tree line in each direction. Such a road can move at least 35,000 people in each direction at peak time. If such roads exist every 0.8 to 1 km all over the city you have adequate capacity for moving people. Such a road need only be 35 metres wide totally.

This is the way forward for a sustainable transport option. Our cities are ready for it. Many of these options are present "illegally" already. We have to recognise them as solutions and not problems as we currently do.

Unless we re-think our plans for flyovers, wider roads, gated communities, "slum" removal, and elevated transport corridors our cities will turn out to be "warmer" than we can tolerate.

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