Where next? Moving towards better urban transport

Introduction

This chapter provides an introduction to some of the most promising transport planning policies in the growing "tool-kit" of ways to bring us closer to people-centred, equitable and sustainable transport in our cities and towns.

There is a strong emphasis on approaches that are integrated, long-term, pro-poor, holistic, focussed on accessibility, aiming to enhance urban quality of life and economic thrift and prosperity.

Key policy approaches include:

- shifting transport to environmentally sound, affordable and health-promoting modes;
- reducing the need for motorised transport by adaptation of land use policies and urban and regional planning;
- relating the costs of transport more closely to distance travelled and internalising transport-related environmental and health costs and benefits.

Integrated, long-term approach

Urban transport cannot be considered in isolation because it has such intimate interactions with the whole urban economy, especially evolving patterns of urban development.

Adopt targets *- Instead of just accepting trends and market signals and inevitable, many of the most successful cities have adopted a vision of the future city and set policies and targets as steps towards achieving that vision.*

These interactions take place over both the short term AND the long term. Transport planning that thinks only about short term results will be a disaster in the long term.

"…long term transport demand responses are different, and usually bigger, than short term responses, because behavioural responses are time-dependent, and include adjustments which take years to be completed. … the effects of pedestrianisation are that there is an immediate impact on traffic, often a short term negative effect on trade that lasts a year or two, then a growth in the number of pedestrians and retail turnover. The effect of bus fare changes seems to be that passenger response after the first year may be doubled, or thereabouts, after five years. Motoring cost changes have a small immediate effect, but are still working their way through car ownership and use ten years later. The effect of changes in transport infrastructure on land use patterns start very swiftly (sometimes even before the infrastructure is opened) but may not be completed for a generation or more." Phil Goodwin, 1997.

The purpose is not to get as many people as possible on to one or other means of transport at any price. The aim should be to create a combination of the various gentle modes of transport to offer alternatives to car travel. The better the quality of travel by these modes, and the better they are integrated, the greater will be the possibility to limit travel by car.

Focus on accessibility

📖 Cervero, R. (1997). Paradigm shift: from automobility to accessibility planning. **Urban Futures**, 22 (June 1997), 9-20.

"Accessibility planning" involves an integrated package of policies which work towards building up the alternatives to private vehicles and gradually restrain the inappropriate use of cars. At the same time the need to travel is gradually reduced by urban planning which brings more destinations within easy reach by foot, cycle or public transport. Priority needs to be given to those classes of traffic, and those transport projects, that contribute most to the economic or social health of the city. These policies do not bear fruit overnight but cities that have adopted such policies consistently over many years have achieved wonders.

Feet First and Pedal Power

Walking is the "glue" for the transport system - almost every trip includes walking.

At the heart of any strategy for people-centred, equitable and sustainable transport must be a fundamental change in transport priorities. Rather than private motor vehicles, it is the most "humble" and vulnerable modes of transport that deserve the highest consideration and encouragement.

Pedestrians and pedestrian rights

Pedestrians are often the most numerous users of city streets, especially in low-income countries. But they are almost always poorly provided for. Pedestrians (and other slow moving modes) have as much right to be given priority as motor vehicles, particularly in cities with low vehicle ownership rates.

Does your municipality have a pedestrian plan?

💻 "Developing a Walking Strategy". Downloadable report from the UK Department of the Environment Transport and the Regions http://www.local-transport.detr.gov.uk/walk/walk.htm

💻 "Pedestrian Planning Guidebook: Incorporating Pedestrians in Washington's Transportation System", Washington State DOT, USA http://www.wsdot.wa.gov/hlrd/PDF/PedFacGB.pdf

💻 "Pedestrian and Bicycle Planning; A Guide to Best Practices" by Todd Litman et al. (Victoria Transport Policy Institute, 2000) http://www.vtpi.org

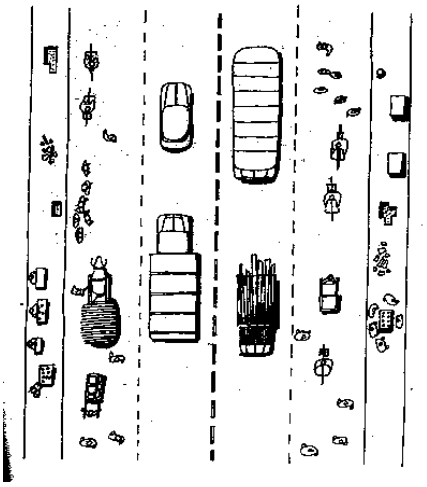
Shirshendu Ghosh (in "Introduction to Traffic Calming" by Rajesh Patel, Geetam Tiwari and Dinesh Mohan (Centre for Biomedical Engineering, IIT Delhi, 1994))

Obstacles drive pedestrians onto the roadway

From Alan Proudlove and Alan Turner, "Chapter 11 Street Management" in Harry T. Dimitriou and George A. Banjo" Transport Planning for Third World Cities" (Routledge, London and New York)

Far too many footpaths/sidewalks are narrow and badly maintained, with irregular surfaces, holes and obstructions. This is especially a problem in low-income and middle-income countries.

Common obstacles in footpaths include: heaps of rubbish or building materials; street traders and their customers; uncovered storm water drains; parked bicycles and motorcycles; electrical substations; traffic-light controls; telephone booths and various poles and signs.



Source: Proudlove and Turner

It is no wonder that so many pedestrians are forced to walk in the roadway.

Many busy streets in low-income cities have a mixed zone within the roadway that is shared by cyclists, pedestrians, carts, the occasional parked vehicle, and crowds waiting for public transport.

People walk on the roadway because it is easier to walk on a well-paved surface with fewer obstacles that the sub-standard footpath. **The best way to remove pedestrians from the dangers of the roadway is to offer a more attractive alternative.** In other words sidewalks must be wide and well maintained to at least as high a standard as the roadway. If the roadway needs to be narrowed to provide a useable footpath then so be it.

Minimise detours for pedestrians

QUESTION: When is a pedestrian bridge or underpass a pedestrian facility and when is it a motor vehicle facility?

ANSWER: Most pedestrian bridges and underpasses are actually motor traffic facilities NOT pedestrian facilities. *Their purpose is to prevent pedestrians from delaying traffic. This is achieved at the cost of great inconvenience to pedestrians and are a complete barrier to wheelchair users.*

Such crossings often make the situation more dangerous than before, since many pedestrians will still try to cross the road at ground level. They are particularly cruel to the frail or people with disabilities.

Walking can be tiring, especially in hot climates. Pedestrians tend to minimise effort, even at the expense of safety. Planning for pedestrians must be realistic and recognise that walkers will almost always try to take the shortest path.

The network of footpaths in the city must be very dense. Waiting times to cross streets should be kept as short as possible.

Level crossings instead of underpasses and overpasses stairs and ramps with convenient gradients, lifts and escalators. Pedestrian overpasses or tunnels are extremely unpopular with pedestrians and should only be used when absolutely necessary.

Ordinary city streets should never warrant a bridge or tunnel. Such grade-separated pedestrian crossings should only be necessary to allow pedestrians to cross high-speed railways, expressways, rivers and other barriers that would otherwise be impassable or very hazardous.

Towards better pedestrian facilities

Traffic calming is a whole package of policies that can bring enormous benefits to pedestrians and to urban areas. More details on traffic calming are given below.

Advocacy groups are springing up around the world to fight for a better deal for pedestrians.

✉ International Federation of Pedestrians

✉ Pedestrian Council of Australia
http://www.ozemail.com.au/~walking/

✉ America WALKs
http://www.webwalking.com/amwalks

✉ UK Pedestrians Association -
http://www.pedestrians.org.uk/

Traffic calming

= the process of slowing down traffic in order to improve the street environment and make it safer for pedestrians, cyclists, shoppers and residents.

But first a short list of specific improvements that can be made to pedestrian facilities.

- ✓ Footpaths should not have sudden changes of level nor should they be broken too often by vehicle crossings. Kerbs should not be too high.
- ✓ Develop pedestrian short-cuts (for example, at mid-block and connecting dead-ends) to create a permeable environment for pedestrians with a fine-meshed network of routes.
- ✓ Where vehicles must cross the footway, the vehicles should be made to change level, not the pedestrians. Thus vehicles are more likely to give way to the pedestrian, as the law should require.
- ✓ Footway width must be adequate and an adequate clearance must be kept free of obstacles. This requires enforcement.
- ✓ Shade for sidewalks is highly desirable, especially where temperatures can be high.
- ✓ Good maintenance of equipment mounted in the sidewalk is important; all too often there are missing drain covers or unfilled excavations in the sidewalks. Good design can help ensure good maintenance. Establish and enforce construction and maintenance standards.
- ✓ Street lighting of pedestrian facilities is more important than lighting the vehicle way, and requires different techniques and equipment.
- ✓ Adopt Crime Prevention Through Environmental Design (CPTED) principles.
- ✓ All cities and towns can and should pedestrianise appropriate parts of their city centres.
- ✓ Reduced car access and slowing down of motorised traffic can bring great benefits (including economic benefits) to areas with high levels of pedestrian activity.
- ✓ Consider putting up a system of road signs for pedestrians.
- ✓ Create plenty of resting points for pedestrians.

Traffic calming is the name given to a very wide variety of measures to quieten, calm and slow down traffic to create a more pedestrian-friendly environment.

Traffic calming measures frequently include lowered speed limits (often 30 km/h), extending pedestrian spaces (footpaths, crossings, pedestrian zones, etc.), reducing the motor vehicle space, physical devices, such as speed humps or chicanes, and extensive tree planting.

Traffic calming techniques can be tailored to suit residential neighbourhoods, shopping streets, and even to main roads passing through villages and small towns.

📖 Hass-Klau (1990) "The pedestrian and city traffic". (Belhaven Press, London)

Traffic calming has so far been most aggressively pursued in the Netherlands and Germany, where an "area-wide" philosophy has been adopted, as opposed to ad-hoc, isolated measures in individual streets. "Zone 30" areas, where traffic is slowed to 30 km/h or so with a combination of speed limits and physical changes to streets, are now a common feature of many European cities. Traffic calming has been applied, to varying extents and in various forms, in almost every region of the world including Asia, especially Japan. It is now widely considered to be an essential part of any package of policies to reclaim the quality of urban life in cities besieged by traffic.

💻🖱 "Take back your streets handbook" by the Conservation Law Foundation, Boston, Mass., USA. http://www.tlcnetwork.org/download.html or http://www.clf.org

Some of the material in this section is adapted from Transport 2000's "Streets for People" network materials.

Benefits from traffic calming

By reducing vehicle speeds, **traffic calming cuts the number of accidents and their severity**. Reductions of 50% have commonly been reported from area-wide traffic calming schemes. Traffic calming makes the street safer for children. Research shows that once traffic calming has been installed, children are more likely to be allowed to walk to school or to local shops independently.

The first 20 mph(30km/h) zones in the UK were installed in 1991. There are now well over 300 in existence and they have been highly successful in reducing road casualties. Pedestrian casualties were on average reduced by around 60% and more so for children - 67% for child pedestrians and child cyclists. (http://www.detr.gov.uk)

Traffic calming can significantly **reduce local air pollution and noise** if it is implemented properly - reducing traffic and encouraging a "calm" driving style.

Traffic calming can **enhance pedestrian and street activity** by making the public environment safer and more attractive. This can benefit shops and help to contribute to community life and reduced crime. For similar reasons, traffic calming can bring economic benefits to an area, especially if access by non-motorised and public transport is enhanced at the same time. A study of German town centres that had varying amounts of traffic calming and pedestrianisation found that the traffic calmed towns had more thriving central shopping than those which emphasised car access (TEST, 1989)

Traffic Calming is good for business too!!

Traffic calming in Japan

Japan has a long independent history of experimenting with traffic calming. Neighbourhood streets in Japan are generally narrow, therefore conflicts between traffic, pedestrians and cyclists became a problem very quickly as traffic increased. In 1974, an area-wide traffic regulation began, called "*Seikatsu* Zone" (Life Zone) with lowered speed limits. There are now 10,000 such zones in the country. More recently physical changes have also been used very widely. Since 1980, "Community Street" projects have been carried out with zigzag shaped streets, increased tree planting, bumps and raised intersections. [IATSS Research Journal, Vol. 19, No. 2, p. 100].

Traffic calming in developing countries

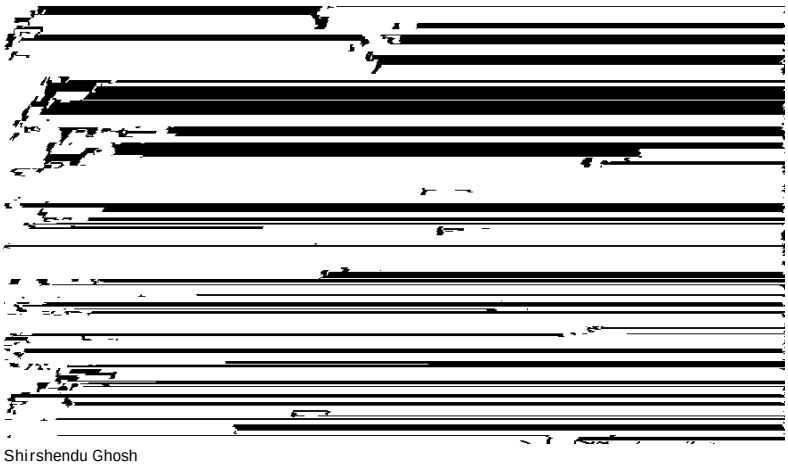
Community anger at the impacts of traffic is not restricted to high-income countries. In fact, Indonesia's low-income residential areas ("*kampung*") are seeing assertive efforts by residents to protect their living space from noise, fumes and traffic nuisance. For example, most alleyway entrances in the *kampung* of the East Java city of Surabaya, have signs erected by the local citizens, which direct motorcyclists to

Patel, R., Tiwari, G. and Mohan, D. (1994) "Introduction to Traffic Calming" (Centre for Biomedical Engineering, Indian Institute of Technology (IIT), Delhi)

turn off their engines and to dismount. Most of them comply. In many informal settlements in Malaysia, residents are installing their own simple speed humps as traffic has rapidly become a nuisance in recent years and speed humps are also now a common feature of middle-income areas in many Asian countries.

"In India, the traffic mix is very different from that in Europe. We have a much larger number of bicyclists, rickshaws, human and animal pulled carts and motorised two-wheelers. Therefore, it is very important for us to experiment with these designs and then evolve new designs which suit our environment better." Patel, Tiwari and Mohan, 1994.

The need for widespread traffic calming is now probably most urgent in the middle-income countries, such as Thailand, Taiwan, Korea and Malaysia, where motorisation has been most rapid and where huge numbers of people are now exposed to unacceptable impacts from traffic. Community efforts should be assisted by transport planners to make sure they are effective and safe. Efforts need to be made to develop and adapt traffic calming techniques which are affordable and which work well in low and middle-income countries.



Shirshendu Ghosh

Objections to traffic calming

(adapted from Transport 2000's Streets for People network materials)

Some people do not like traffic calming. **On the left are some of the objections sometimes made to traffic calming. On the right are answers and possible solutions to these objections.**

"It's noisy, increases pollution (as cars slow down and speed up again)."

Increased noise and pollution are signs of a badly carried out traffic calming scheme. In a properly-designed scheme, drivers adjust their speed to a steady lower level and do not brake and accelerate before and after traffic calming features, so pollution and noise levels should not increase. Many traffic calming schemes will actually reduce traffic volume (as drivers stop using residential streets as rat runs), which will mean less pollution and quieter streets.

"It diverts traffic onto other roads."

Traffic diversion onto other sensitive streets can he prevented by calming a wide area, not just one or two streets.

"Humps are uncomfortable for bus passengers and cause problems for the emergency services."

Road humps are probably best avoided on bus routes as they can cause discomfort for passengers and bus drivers. Alternatives include bus-friendly speed hump designs (for example, "speed cushions") and road narrowings.

Emergency services are often broadly supportive of traffic calming because it reduces casualties, but may be concerned that specific schemes may increase the time it takes a fire engine or ambulance to

reach an incident. However, the delay is actually small since aggressive traffic calming measures are usually implemented only on side-streets and most of the trip takes place on main roads.

Road Danger Reduction

There is an urgent need for greater attention to the safety of vulnerable road users, using such measures as control of vehicle speeds, safer vehicle exteriors and locally-appropriate (and affordable) traffic calming techniques.

It is important that measures that are supposed to improve the safety of vulnerable road users do not unduly restrict their mobility or discourage walking or cycling. The over-use of pedestrian bridges and tunnels in many Asian cities is an example. These so-called "pedestrian facilities" speed up motorised traffic but make life much more difficult for pedestrians and curtail the mobility of people with disabilities, non-motorised vehicles and hand-carts. They also often actually increase the risk of accidents since in most cases many pedestrians will continue to cross at road level.

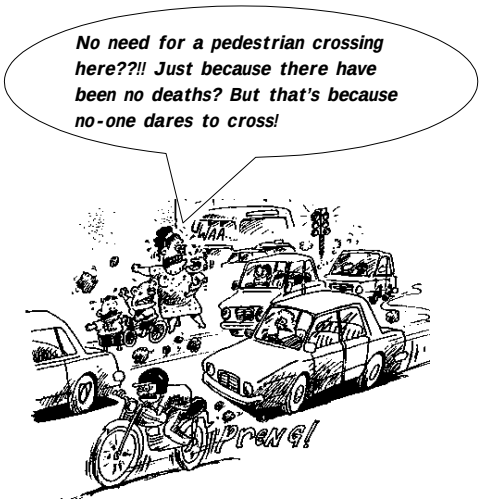
💻🖱 Road Danger Reduction Forum
http://www.btinternet.com/~spokes/isitsaf1.htm
(Road Danger Reduction Forum Secretariat, City of York Road Safety Unit, St. Leonard's Place, York, UK. Email: ken.spence@york.gov.uk)

📖 John Adams, "Risk and Freedom: the Record of Road Safety Regulation" (Transport Publishing Projects, 1985).

"Road danger cannot be measured by accident statistics. Up and down the country people are living alongside dangerous roads. When they complain, they are frequently puzzled to be told that their road has a good accident record – and frustrated when told that they are not entitled to remedial measures, such as pedestrian crossings, until they have produced their quota of road accident martyrs.

As the level of danger changes, people notice and respond. As cars are made safer by better brakes, tyres and suspensions, and more crash protection, behaviour changes. Motorists do not sit back and enjoy an additional margin of safety. They drive faster, or brake later, or drive with less care and attention. The potential safety benefit is traded in for a performance benefit. And the most vulnerable road users – pedestrians and cyclists – learn to defer to the least vulnerable – those in cars.

Because people perceive and respond to risk, accident statistics are a useless measure of safety. In many cases there will be a negative correlation between danger and numbers of accidents. If a road becomes so terrifyingly dangerous that no one attempts to cross it, it will have a very good pedestrian accident record – and those responsible for safety will pat themselves on the back." John Adams (1985).



Source: Cabai in "Ideas for Action - Making Urban Areas Child-Friendly"

Increasingly, safety advocates and transport planners are coming together to seek a more holistic approach to reducing traffic danger.

A "road danger reduction" approach to traffic safety issues seeks a genuine reduction in danger for all road users by identifying and controlling the principal sources of threat. This approach actively promotes cycling and walking, which pose little threat to other road, users, by taking positive and coordinated action to increase the safety and mobility of these benign modes. This new approach is reflected in the Delhi Declaration below.

The Delhi Declaration on the Safety of the 'Vulnerable Road User' (ICTS 1992) *adopted at the International Conference on Traffic Safety held in New Delhi 27-30 January 1991.*

"The groups that are today the vulnerable road users are an important and desirable part of the entire transport system. Walking and bicycling in particular are to be encouraged and promoted by appropriate planning of the transport environment because of their low cost, negligible energy consumption, and environmental compatibility.

Well-designed and maintained public transport systems can reduce overall casualty rates by encouraging low-risk travel. Good urban planning reduces

An approach to safety that protects vulnerable road users and actively promotes walking, cycling and public transport.

casualty rates by encouraging low risk travel. Good urban planning reduces risk by diminishing unnecessary and inefficient journeys.

Inappropriate speeds by motor vehicles are a major cause of accidents, especially in urban situations. Lower speeds generally result in fewer crashes and less severe injuries, and therefore should be systematically fostered in urban areas.

Road environments can be designed to control speeds, to separate road users of different sizes, weights, and velocities; to reduce the probability of road users making mistakes; and to minimise injuries if a crash does occur.

Each element of a program to develop traffic safety- education and enforcement, changes in the road environment, and improvements in vehicle design- can make important contributions, but these elements are most effective when they are integrated into a comprehensive program appropriate for the physical, cultural, and social environment of the particular region or country.

There is need for improved emergency communications, patient transport, and trauma care systems.

Resources in less motorised countries are very limited, and therefore transport safety programs should be carefully planned and optimised. A good database is essential and the development of adequate definitions and data collection systems are vital for planning appropriate countermeasures and evaluating their effectiveness.

Vehicle exteriors can be designed to be less injurious to vulnerable road users. Such designs should be introduced by vehicle manufacturers and enforced through national and international regulations and by greater legal liability."

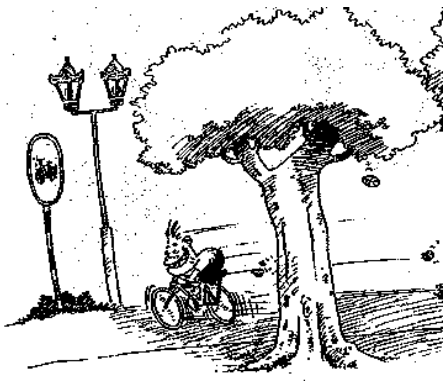
Bicycle policy

The first step towards increasing the role of bicycles and improving their safety is to declare it as a priority.

A significant role for bicycling can be a valuable part of an integrated urban transport system which brings great benefits for the city as a whole and for the individuals who can benefit from the convenience and pleasure of cycling. Provision for cycling is extremely cost effective.

In most countries of Asia and the Pacific, outside of Japan and China, there is little provision of infrastructure for non-motorised vehicles (NMVs) such as bicycles, rickshaws and pedicabs. Australia, Singapore and South Korea are just beginning to make a concerted effort.

NMV = non-motorised vehicle



Source: Cabai in "Making Urban Areas Child-Friendly".

Japanese cities have extensive networks of bike lanes and a tradition of sharing footpaths with pedestrians (which has encouraged cycling despite some problems for pedestrians). There is plentiful bicycle parking: everything from simple bike racks, covered bike racks, to bicycle "parking garages" at high-use areas like subway stations.

Many Chinese cities have extensive networks of bicycle lanes, segregated from motorised traffic, that allow for safe and efficient movement of large volumes of bicycle traffic.

Bicycle use is severely threatened by increasing traffic in many cities and towns of the region. But there are many practical, low-cost measures that can be adopted to encourage the preservation of NMV use where it is still high, and increase its use where it is declining or under threat.

Does your municipality have a bicycle/pedestrian officer?

One important step is to make sure that affordable bicycles are available in numbers on the local market. In Asia this has usually been achieved through encouraging local manufacturing - successfully in China, India, Pakistan, Taiwan and Japan. But in Bangladesh the lack of a significant domestic bicycle industry and the existence of high tariffs on imports have contributed to bicycles being beyond the reach of the poor. Liberalisation of imports of bicycles would benefit potential bicycle customers. There are some examples of successful credit schemes for the purchase of non-motorised vehicles by low-income people in Sri Lanka and Bangladesh. Low-interest loans for bicycle purchase are also available in at least some Indian cities.

Some elements of successful bicycle planning

Myth: *Cars are Modern, and Rickshaws, Pedicabs, and Bicycles are old fashioned.*

Fact: *The first cars were developed in the 1860s. The Rickshaw was not invented until the 1870s. Both railroads, trolleys, and bicycles are somewhat older, being invented in the first decades of the 19th Century. In fact, all currently used transport technologies have been around for more than a hundred years. (Source: ITDP)*

Successful cycle planning involves much more than the building of special facilities. Action is needed across a wide range of agencies, including those dealing with transport, environment, leisure, health, land use planning, education, and law enforcement.

- ✓ The most successful cycle policies are those which are part of broader, sustainable transport policies.
- ✓ Cycle route networks should be comprehensive, safe, direct and attractive.
- ✓ Promotional campaigns stressing the speed, utility and health benefits of cycling are important components of local cycle strategies.
- ✓ Reducing traffic speeds, particularly through traffic calming measures, is a vital element in improving cyclists' safety.
- ✓ Much better links between cycling and public transport.
- ✓ Prevention of cycle theft is an important part of bicycle promotion.
- ✓ Cycling facilities can be very cost effective but governments do need to commit resources to make increased cycling a reality.
- ✓ Pro-cycling measures are generally perceived to be positive and are extremely popular with the general public.
- ✓ Develop a National Cycling Strategy, backed up by comprehensive strategies at local level.
- ✓ Set targets at national and local levels to increase the modal share of cycling, whilst respecting local circumstances.

A large proportion of urban trips are under 6 km long. Enormous potential exists for cycling in most cities, if conditions can be improved.

✉ Thailand Cycling Club

✉ Bayk Aksyon (Bike Action), Philippines

✉ Bicycle Federation of Australia (BFA)

✉ Institute for Transportation and Development Policy (ITDP) http://www.itdp.org

✉ International Bicycle Fund (IBF) http://www.ibike.org

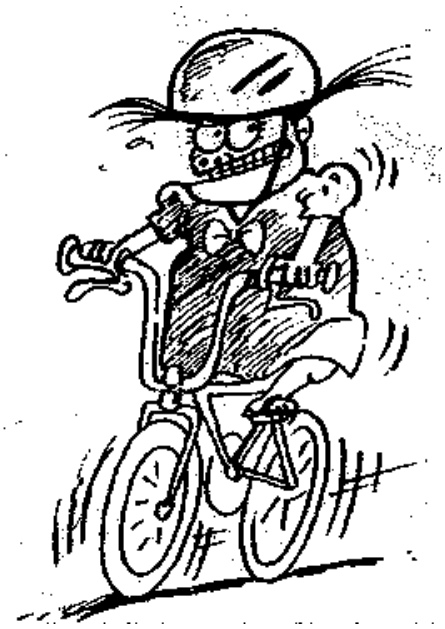
Bicycle Route Networks

The influential Dutch 'Bicycle Master Plan' was a design manual for cycle-friendly travel. The manual suggests **five principles for cycle routes: • Attractiveness • Coherence • Comfort • Directness • Safety**.

A bicycle route is not necessarily an off-road cycle paths, or bicycle lane on the road. It could be a traffic calmed street. Cyclists can with other vehicles on low-speed (30 km/h zones) and traffic calmed roads. What is important, is that there is a fine-grained network of routes to accommodate all cyclists' needs.

Examples of pro-bicycle measures

Adapted from material by T&E



Source: Cabai in "Making Urban Areas Child-Friendly".

- exemption from one-way regulations for cyclists
- passages that allow cyclists to pass through pedestrian zones in the city centre
- convenient passages for cyclists through road blocks for car traffic
- allow bicycles in suitably designed bus lanes
- traffic light bypass options for cyclists turning left (or right in countries which drive on the right-hand side of the road)
- time saving sequence of green lights for cyclists
- separate traffic light signalling for cyclists and pedestrians
- connections and shortcuts for pedestrians and cyclists
- friendly right-of-way regulations (no stop signs on cycle routes, priority for cycle routes over byroads)
- cycle lane to bypass cars waiting at red lights
- removal of obstacles (ramps instead of stairs, grooves for pushing bicycles along stairs, ...)
- improved street surface (asphalt instead of paving, sewer drains and covers without longitudinal grooves)
- cycle lanes of sufficient width
- speed humps and raised pavements that do not obstruct bicycle traffic
- In the access area around intersections, special lanes can be marked for cyclists going straight ahead or turning.
- Cyclists should always be given advanced stop lines in front of the car stop lines.
- Roundabouts with a maximum outside diameter of up to 30 m can be used easily by cyclists. Smaller roundabouts contribute to traffic safety by reducing the velocity of motorised traffic. For reasons of safety, roundabouts must never be fitted with cycle paths or cycle lanes.

POLICE ON BICYCLES

Officials in this US town of Dayton have found that putting some of their police officers on bicycles not only saves the city a great deal of money and reduces pollution but has also facilitated very effective policing and has improved the relationship between police and members of the public. Having police on bikes has also helped to promote the use of bicycles by other residents. These experiences have been common to many of the large number of police departments around the world which have adopted bicycle patrols since the early 1980s (including 1,200 in North America alone). There are now two international organisations which are sharing these experiences: the International Police Mountain Bike Association (IPMBA) and the Law

Enforcement Bicyclists Association (LEBA). Dayton's Bike Patrol and IPMBA have developed a "Police Cyclist Course" which is being used to train students from law enforcement agencies worldwide. [Source: International Council for Local Environment Initiatives (ICLEI) Case Study No. 42]

In defence of pedicabs

Pedicabs are NOT inefficient or backward. Just like taxis, buses and bicycles, they have a legitimate place as part of an integrated, people-centred and sustainable system of transport. They are uniquely suited to a particular niche - or class of trips. Recently, several cities in the West have even started pedicab services in their central areas.

In many cities around the world that still have pedicabs, the pedicab drivers face many difficulties, including exploitation by owners of fleets of pedicabs.

> *Faced with this inequality and exploitation, how have different governments responded? In many countries there have been attempts to help rickshaw-pullers, mostly under the heading of 'rickshaw to the puller'. But everywhere these attempts have been rather half-hearted, whereas a lot of official energy has been devoted to abolishing the rickshaw…*
>
> *… The real reasons for wanting to abolish cycle-rickshaws had nothing to do with 'efficiency' or 'humanity.' After all, rickshaw drivers were not the only undisciplined road-users. Nor were rickshaws the most wasteful users of road space. As for the 'humanitarian reasons', the authorities cared very little about the other aspects of the pullers' lives.*
>
> *The real reason for wanting to do away with cycle-rickshaws was that wealthy people didn't like them. They detracted from the modern city image that they were trying to create, and they got in the way of the motor cars. (Gallagher, 1992)*

Any city in which private cars face little or no restraint or restrictions can have no justification in restricting the operations of non-motorised vehicles, including pedicabs.

Public Transport Priority

> *Public transport priority and investment must be a centre-piece of any integrated package of policies aiming towards people-centred, equitable and sustainable transport.*

The need for more plentiful and more efficient public transport is very clear to most residents of cities in Asia and the Pacific. Especially, public transport needs assistance to keep moving in spite of increasing traffic congestion, which is caused mainly by private vehicles.

Public transport systems can move large numbers of people with less use of scarce resources (including land, fuel and environmental costs). Space efficiency is a primary reason that most public transport modes are considered to be very "**city friendly**". Some planners despair over ever improving their city's public transport. Fortunately, there are numerous tried and tested methods of improving public transport. The problem is usually a lack of political will, inadequate institutions and lack of determination rather than technical barriers.

✉ International Union of Public Transport (UITP): Umbrella group and think tank with 1,700 members including the world's most important public transport operators, authorities and suppliers. UITP has an Asia/Pacific Committee. http://www.uitp.com/

Perhaps the most important benefit of good public transport is that it reduces the need and desire for private vehicle ownership to some extent and thus can massively reduce the amount of motorised travel.

Every city deserves plentiful, affordable public transport. The policies outlined here will work best if they are assisted by many complementary policies such as demand management of private vehicles, along with pro-pedestrian and pro-bicycle policies.

✉ Public Transport Users Association, Victoria, Australia:
http://www.vicnet.net.au/~ptua/firstpt.htm

The most successful public transport systems have actually become a competitor to the private modes (the car and motorcycle). They retain customers from all social classes (not just the poor) and are used for a wide range of urban trips at all times of the day (not just for trips to work in the peak hour).

On the other hand, public transport operators which are content to cater only to their "captive" market of low-income people and city-centre workers are doomed to slow decay, poor cost-recovery and failure to contribute to the vitality of the city.

Speeding buses with on-road priority

Taipei's successful new bus lanes in the centre of the street. Photo: Barter

In the absence of on-street priority, buses are prone to a VICIOUS CYCLE *- as congestion increases, buses become slower and less attractive and even more people desert them for cars and motorcycles, thus making the congestion even worse.*

WITH on-street priority, buses can benefit from a VIRTUOUS CYCLE! *As congestion worsens, buses with good priority become MORE attractive and their share of passenger traffic can rise.*

Bus priority methods enable buses to pass traffic queues and penetrate streets or zones that are denied to private traffic. They indicate to motorists how society values the bus traveller. Even in cities with extensive urban rail systems, buses will always be important and it is vital that they receive priority on the streets to make them immune to traffic congestion as much as possible.

Examples of bus priority methods include: with-flow and contra-flow bus lanes; exemptions from banned turns; bus gates; bus priority streets; selective vehicle detection (SVD) at traffic signals. Most of these methods can also be used with jitney services and also with trams running in streets. These methods are all well tried and documented and are effective if they are given the appropriate enforcement.

Bus lanes in the centre lanes of a road (or median bus-lanes) are also becoming increasingly popular (as in Nagoya and Taipei).

Reserved busways have also been successful in a number of cities around the world, particularly Brazil. High quality busways using articulated buses (or even bi-articulated high-capacity buses as in Curitiba, Brazil) are said to be able to approach the level of service, speed and capacity of surface light rail systems.

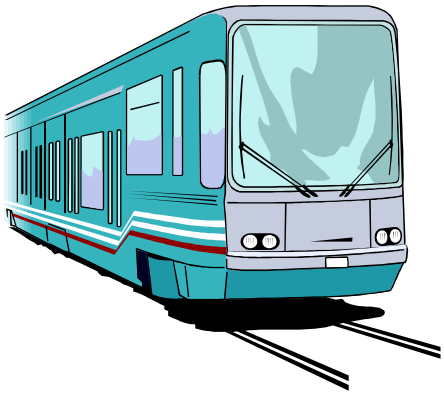
Speeding up the buses can be equivalent to expanding the bus fleet. For example, if bus priority can increase the number of round trips per day from 6 to 7, this it is equivalent of adding 167 new buses to a fleet of 1000 buses.

Speed of ticket purchase or validation is an important factor in bus speeds and bus delays. There are several solutions which allow for quicker boarding, including: employing ticket sellers to sell tickets to people waiting in queues; ticket machines at bus stops; pre-purchased tickets save much time (eg weekly or monthly travel-cards or other pre-paid passes or tickets).

Urban rail

Urban rail systems are well suited to dense urban corridors in relatively large cities if they are able to afford their high capital costs. Most low-income cities will find it difficult to afford rail. Large,

For many years the World Bank was opposed to any urban rail investment in developing countries. Its attitude now is less dogmatic and it has begun to finance urban rail systems in certain circumstances.



Bus versus rail debate has often missed the point

middle-income cities can often justify rail systems on dense corridors, especially if they are also restraining private vehicle traffic. *[Arguably, if a city is able to afford a network of expressways, then it could have afforded some kind of rail system.]*

Various kinds of light rail systems offer an intermediate-cost rail option, that can be attractive and easily integrated into the urban fabric, especially if they are placed on the ground within road rights-of-way. Most of the success stories of increased public transport patronage in Switzerland and Germany in recent years have involved the use of light rail. Unfortunately, most Asian examples so far are very expensive elevated systems. Governments have been very reluctant to take space from traffic to put the systems on the ground.

Rail systems are not a panacea to urban transport problems as some people think. However, in suitable cities, rail can play a key role as part of a virtuous package. The high profile and popularity of rail systems can sometimes help to generate the political will to carry on with the other, less glamorous parts of such a policy package.

The issue of bus versus rail has been a contentious debate, especially in developing countries, in which the World Bank opposed rail investment for many years. Neither a fundamentalist pro-bus/anti-rail stance nor the opposite stance seems to be a good approach.

For large cities, with density above a certain level and with incomes above a certain level, there will be a need for a network of high-capacity public transport that is segregated from traffic. Cities that are growing, whose incomes are rising and with high densities need to start identifying and preparing corridors for such transit systems even if they cannot afford them yet. In the meantime, bus system must not be neglected, since rail will later have a hard time being successful if bus ridership is allowed to plummet.

In many cities, a staged approach to mass transit development might be a viable alternative. Mass transit corridors must be identified early and the land reserved for them. These corridors must be compatible with the vision of the future directions of urban expansion. Such a reserve could first be fitted with a busway and later upgraded to rail service if this become justified and affordable. Some Brazilian cities appear to be moving along this path.

Encourage diversity: legitimate role for jitneys

How to manage competition - competition "for the road not on the road". World Bank has recently done lots of work on this and adopted a more open approach after a period of taking an ideological "free-enterprise at all costs" approach.

Since early in the 20th Century various cities have tried to eliminate free-wheeling jitney services with various justifications, including that they compete unfairly with main-line services, that they are undisciplined, that they are linked with crime, that they use polluting vehicles, cause congestion, stop at dangerous points, wait at congested locations, that they drive dangerously, and many others. Some of these problems are real in cities with large numbers of jitneys. However, there are also many benefits of such services, especially by filling a desperate need in cities where the conventional public transport system is a failure.

📖 Cervero, Robert (1997) "Paratransit in America: redefining mass transportation" (Praeger, Westport, Connecticut).

Manila Jeepneys are a famous type of jitney. Photo: Barter

Instead of overly restrictive regulation or suppression of jitneys, authorities need to regulate more carefully to ensure safety and to encourage the jitneys to complement rather than compete directly with other public transport services. In general, cities that have taken a liberal approach and allowed these and other similar paratransit services to really flourish have been able to maintain high levels of public transport usage better than cities which have been restrictive.

There are exceptions - some government-owned bus systems have done reasonably well, as in Mumbai or Madras. However, the enforced takeover of all public transport under a small number of large operators is not necessarily the most efficient or effective policy.

Many of the more successful jitney systems around the world are those that also have a measure of organisation among themselves, through route associations or collectives, which undertake to regulate and discipline their drivers and can negotiate with the authorities.

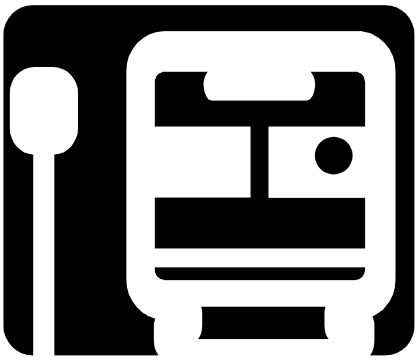
There does seem to be a role for jitney-type operations in many contexts. Even many rich cities are now promoting new forms of demand-responsive public transport to complement their line haul modes.

Ideally, the right kind of vehicle and method of ownership and management will find its niche in the appropriate parts of an integrated network. Governments can ensure that regulation encourages complementarity and integration. **There are no simple answers but policy can be guided by principles of good governance, fair-play, transparency. The most important thing appears to be a solid and determined commitment to improving public transport.**

Integration

*Singapore describes its integrated public transport system as one which is **"planned and also marketed as one"**, even though several operators and companies are involved.*

> *Urban public transport can be divided into '**hardware**' and '**software**'. There are 7 elements. Hardware includes the network, the modes of transport and the urban fabric that is serviced. Software includes the operation of the scheduling, fare systems, marketing, and management…. All of these 7 elements can be handled separately… but… In an integrated public transport system all 7 key elements are institutionally required to communicate and to coordinate together [even if they remain under many different authorities]. (Felix Laube, 1995).*



For passengers, the most obvious benefits of integration of a city's public transport system include:

Fare integration - one type of ticket and/or fare-card can be used for all modes of public transport, ideally with free transfers and high usage of passes rather than single tickets;

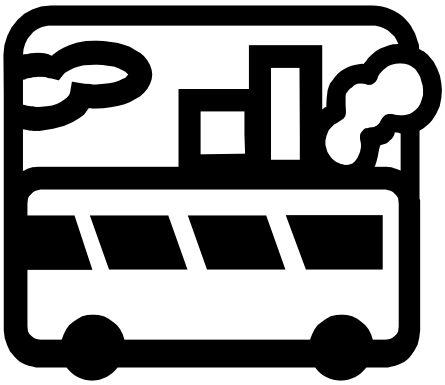
Information integration - the public transport system is marketed as an integrated package. Information for passengers is easy to find and is provided by a single body (eg just one telephone hotline, a single map or information booklet, etc);

Physical integration - good transfer facilities and waiting areas are provided for all modes and walking distances for transfers are minimised;

Network integration - a comprehensive system of routes and their schedules are well-planned to provide easy transfers and high frequencies of service on popular routes. Better to cope with low demand times or routes with smaller vehicles than with lower frequency of service.

Better Marketing of Public Transport

If public transport is to be attractive, even to car owners, then it will need to get much better at providing an attractive service and marketing it well. Since the early 1990s, marketing of public transport has become much more imaginative and exciting in many cities, especially in Europe. Some elements of this new approach include:

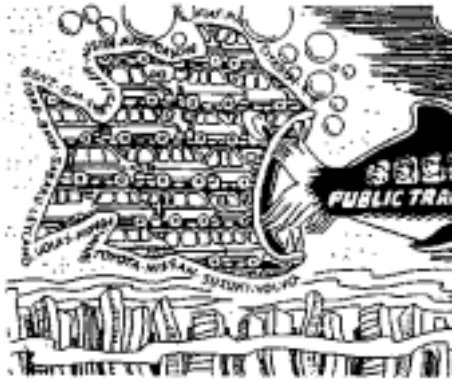


- Integration to allow seamless transfers and easy trip planning (see above)
- Attractive range of fare options - especially periodic fare cards or *Rainbow tickets* and an increase in the proportion of pre-sold tickets.
- The aim is to persuade customers to commit themselves to using the system (in the same way a car owner is committed by their large up-front purchase).
- Open fare systems with roving inspectors are the most passenger friendly and help to speed up bus loading. The chances of meeting an inspector must be high in an open system to deter free riders.
- Innovative route networks and schedules with pulsed and regular departures to allow easy transfers and predictability for the customer.
- It should not take an expert or a regular user to be able to know how to use the public transport system - even for complicated journeys. Operators need to provide improved information on routes, timetables or frequencies.
- Information on services, including service numbers, routes and times must be visible and easily decipherable for users at stops and stations.
- Bus stop displays can now provide information on expected time of arrival of the next few buses.

Budget priorities and the subsidy question

There are two main arguments for subsidies of public transport:

First, **distributional or social welfare arguments** in which the subsidy is argued to be an ethical obligation to those in poverty. Ideally, this would take the form of a direct income transfer (or using vouchers or such like) to those most in need, who could then spend the money according to their most pressing needs. In practice, most subsidy to public transport is not particularly well-targeted to the poorest people. This is especially true in low-income settlements where the poorest people cannot afford even subsidised public transport fares.



IPS

Second, there are **allocative efficiency arguments** for a subsidy to public transport. This argument rests on the fact that there are several market failures which tend to distort consumption and investment spending away from public transport and towards private transport. In this argument, the best option would be to remove the market distortions and other biases which advantage private transport at the expense of other modes. However, in the meantime subsidies to public transport operations and investment are seen as a "second-best" option.

The debate is complex and heated. And the parameters vary from country to country. The best that can be said is that subsidies alone are not a panacea. But carefully tailored and well-targeted public transport subsidies of some kind may have a place within a package of integrated policies in many countries. Great efforts are required to ensure that such subsidies do not disappear into inefficiency and corruption as all too often happens.

Public transport in small cities and towns

Small settlements often have particular trouble with public transport. Many towns that sorely need a public transport system, simply do not have one and residents without private vehicles must use other vehicular modes or walk long distances. It is certainly easier for large settlements to support a plentiful and frequent public transport system. Furthermore, the administrations of small cities and towns may lack the expertise and staff resources to oversee their public transport system. National and state governments need to encourage and foster the development of public transport in smaller settlements. Where informal operators are ready to fill a glaring gap in service, governments need to be careful not to stand in the way.

Urban Planning and Land Use

Urban planning practice can have a dramatic impact on the viability of different modes of transport, particularly over the long term.

There are several main areas of urban planning which are of special importance to transport. These include: the overall attitude towards urban density; retail location policies; business location policies; and housing location policies. Furthermore, the detailed aspects of urban design can also have an impact of transport behaviour and can be an expression of priorities in the city. Many of the policies discussed in this section fall under a set of policies called, **Transit Oriented Design (or Transit Oriented Development - TOD)**. Transport policy and urban planning policy also interact closely to have an impact on the issues of housing for the urban poor (and housing equity) as well as the issue of built heritage conservation, especially in city centres.

The Compact City

There is much debate in the literature over urban density and transport but some broad principles are widely agreed.

Very low urban densities, like those found in the suburbs of cities in the United States and Australia are associated with very high levels of

"A short walk trip is the highest achievement of urban transport planning. Obviously it is not possible for all activities to lie within walking distance, but it is possible by bad planning for the great majority to lie beyond walking distance." (J.M. Thomson, 1977, in "Great Cities and Their Traffic")

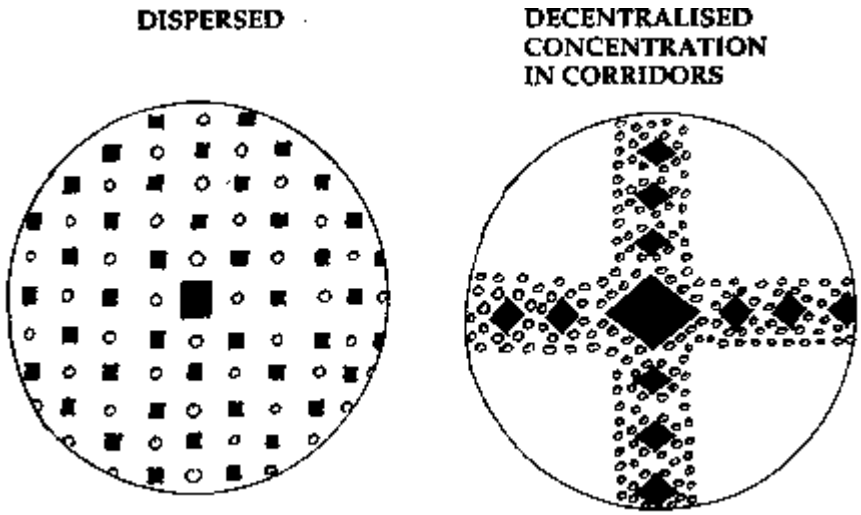
dependence on private cars. This urban form has faced a fierce attack over the last two decades. Such extremely low urban densities (<20 people per hectare) do not exist anywhere in Asian cities. Nevertheless, **cities everywhere would be wise to prevent areas with very low densities from emerging.**

Extremely high densities, such as those of Hong Kong (300 pph), Seoul (almost 250 pph), Cairo, Bombay or Shanghai, make high car use absolutely impossible and allow public transport, walking and non-motorised vehicles to potentially flourish. However, such extreme densities have some of their own problems. One problem is that even with very low levels of private vehicle use, these cities are prone to traffic congestion, severe traffic nuisance and local air pollution, even from public transport and goods vehicles only! Some commentators have expressed negative aesthetic reactions to a built form with too many tall buildings, beyond a "human scale".

Urban densities of between around 50 people per hectare and 150 people per hectare (across the entire urban area) seem to be compatible with a healthy balance of viable transport modes as well as allowing for a range of housing types, plentiful green space, and can potentially have a human-scale built form with low or mid-rise building throughout. Most European and Japanese cities are within this range of densities. Many Latin American cities and smaller Asian cities are also in this range.

Dispersed urban form *tends to promote high levels of car and motorcycle use.*

"Decentralised concentration" in corridors *tends to promote thriving public transport and a high role for cycling and walking.*



Newman and Kenworthy, 1999

Dispersed = scattered homes and jobs; low density uniform; car-based but shorter journeys (hopefully).

Decentralised Concentration in Corridors = concentrated sub-centres of houses and jobs; variety of densities from high to low; transit-based supplemented by cars and bikes. (Newman and Kenworthy, 1999, Sustainability and Cities: Overcoming Automobile Dependence)

High urban densities in many developing cities are a CHALLENGE. But high densities also present OPPORTUNITIES.

The high urban densities of cities in Asia are best served by high levels of public transport, walking and cycling. The same density factor means that it is physically difficult to accommodate many motor vehicles. It is not possible to provide the same level of road provision in dense cities as in lower density cities.

Tokyo, Singapore, Hong Kong and Seoul illustrate some of the potential of policies that explicitly restrain private cars and promote collective public transport, walking and non-motorised vehicles in dense cities. They show that successful urban transport systems are possible even with low road provision.

On the other hand, Bangkok illustrates that a 'traffic disaster' can arise very quickly as motorisation increases in a dense city. Thus the high densities of Asian cities provide transport planning with both challenges and opportunities. There are challenges because such cities are vulnerable to traffic saturation, but there are opportunities because land-use patterns in Asian cities are potentially highly suited to the non-automobile modes of transport that can contribute to sustainable transport consumption patterns.

Policy settings aimed at exploiting this opportunity are likely to reap rapid and significant benefits. In this respect, many Asian cities have an advantage over most Western cities in trying to foster sustainable transport consumption patterns. Most Western cities, especially in the United States, are much more deeply "addicted" to high private mobility and have built their suburbs to be highly dependent on cars and extremely wasteful of energy used for transport.

Retail location as a transport policy tool

Around the world there is growing concern about the growth of "out-of- town" shopping centres (large shopping centres located outside of established centres of activity) and their effects on traffic growth.

📖 Bartholomew, Keith (1995) Policies and Places: Land Use and Transport in the Netherlands and the United Kingdom. 1000 Friends of Oregon.

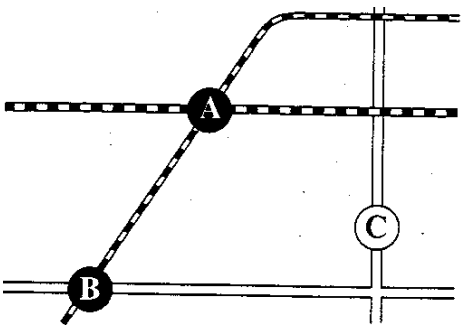
All cities and towns need policies on the location of retail developments, in order to sustain or enhance the vitality and viability of existing town centres and to ensure that access is likely to enable a choice of transport mode. This will usually mean locating retail development in or next to existing town centres and concentrations of people. Such policies have already been enacted in the Netherlands and in the United Kingdom.

Business location as a transport policy tool

Similarly, policies are needed to make sure that employment-intensive or travel-intensive businesses get located on sites that are easily accessible by public transport, walking and cycling and not just by private vehicles. Less travel-intensive businesses may be located in areas without such accessibility.

"The right business for the right location."

The Netherlands has enacted this policy in the form of the famous ABC business location formula. "A" locations are highly accessible by public transport and should be the location of buildings with very many employees and/or intensive use by the public.



The ABC System of the Netherlands (visual from T&E)

"C" locations are accessible primarily by road and must be the location of businesses that generate essential road traffic (such as goods traffic). For example, goods warehousing and trans-shipment centres. "B" locations are somewhere in between.

More sophisticated systems for categorising locations are also possible but the idea remains the same.

This system is one element of "transit-oriented development" or TOD. The overall densities of A locations will be high with the details of urban design being highly suited to walking, cycling and public transport - and restraining of private cars. Car parking can be restricted to a minimum in A locations, since such locations will be highly accessible by other means.

Housing location as a transport policy tool

Housing location also needs to be planned with an awareness of the transport implications. Authorities and developers should aim to locate the "maximum amount" of new housing in existing urban areas where it is easily accessible to a wide mixture of different uses (eg., schools, shops, recreational facilities) and to alternative transportation modes.

In praise of land-use mixing

Creating housing-only enclaves should also be avoided as it removes the possibility of fulfilling many needs through short trips. The same applies to commercial-only enclaves. **There are many transport benefits from vibrant, mixed-use areas** and many non-transport benefits, including maintaining "street life" throughout the day and evening, which reduces the danger of street crime.

A wide variety of different uses can be juxtaposed in close proximity to each other without causing significant problems. Many cities have strict zoning rules that can be relaxed to a great extent. Mixed land-uses has been the tradition throughout Asia and the Pacific and many planners feel that this is "backward". However, it is actually a valuable feature of these cities. Only noxious land-uses that are incompatible with residential areas need to be excluded from mixed use areas.

Housing for the poor

Access to affordable transport is one of the most important factors in determining livelihoods for the urban poor. A survey of pavement dwellers in central Bombay by an NGO, SPARC, showed that 80% walked to work. Their choice came down to: "they were willing to live in congested dwellings without safety or security just so they could walk to work". Other studies have found similarly very limited mobility by the urban poor, especially poor women.

Some of the urban poor have to make a different trade-off by accepting long travel distances from a peripheral location in order to obtain affordable but secure housing. For some this trade-off is forced on them, since in many cases relocation sites (after evictions) are often in remote locations that take little or no account of access issues.

Urban Links - Philippines

The poor themselves need better mobility but poor people suffer from the impacts of the high mobility of the rich

Expanding the level of mobility that is affordable to the urban poor would expand their range of shelter options. On the other hand, an increase in the motorised mobility of higher-income groups can actually decrease accessibility by the poor by undermining non-motorised and public transport and by dispersing their destinations. This suggests that if attempts to achieve greater mobility in low-income cities are to help the poor then they must not focus on private vehicles. In fact, they must actively restrain private vehicle use and focus instead on the modes that are most used by the urban poor.

There are additional connections between transport and shelter issues. Unrealistically high standards and requirements for transport infrastructure in new developments (such as minimum road width standards and minimum parking supply requirements) significantly raise the cost, taking them beyond the reach of the poor. This is true in both low-income and high-income cities.

Conversely, an explicit decision not to provide access by four-wheeled motor vehicles to houses within low-income settlements is one way that such settlements can avoid or reduce 'gentrification' even if they are located in central areas.

Transport projects themselves have become an important cause of relocations and forced evictions. Transport is the largest cause of resettlement in the World Bank's portfolio of projects. Transport-related resettlements and evictions effect the poor in disproportionate numbers because low-income settlements naturally tend to be identified as low-cost, "easily cleared" alignments for new transport routes.

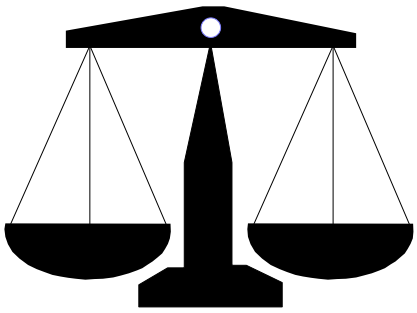
Street dwellers are particularly prone to evictions which are justified on transport efficiency grounds, including in the interests of pedestrians and the pedestrian environments. A humane and just approach is demanded here. Solutions must be sought over the long term; there is no way in which homeless families can be prevented from sleeping or cooking in the streets (as is common in India) until other opportunities are provided for them.

Urban Heritage Protection

Historic central areas of old cities are especially vulnerable to the impacts of traffic and of planning that tries to adapt the city to increasing traffic. Strategies which many European and recently some Japanese cities have used to preserve entire historic urban areas include a combination of traffic calming, pedestrianisation and enhancement of public transport and bicycle access.

Transport Equity and Justice

There are groups of people in every city that face severe disadvantages in access. This is true in low-income cities and also in high-income settings, as mentioned by the following quote. Reforms are needed to specifically promote transport justice for people who are disadvantaged.



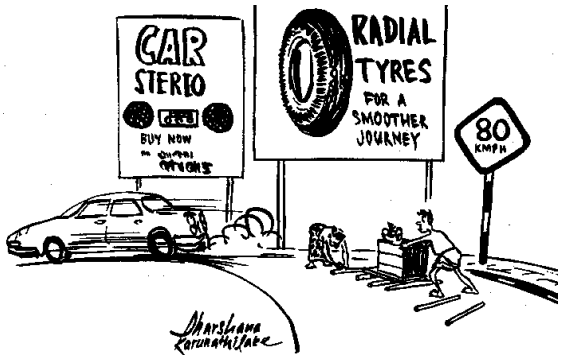
"And while we might be able to re-engineer the car to spew non-toxic emissions and run on renewable energy resources, and perhaps one day introduce smart technologies so that motorists can bypass traffic snarls, ***there is no technology that can redress the social injustices inherent in a sprawling , auto-centric landscape*** *- the separation of the poor from job opportunities, the immobility imposed on those too young, old, disabled to drive, the thousands of hours (disproportionately shouldered by women) chauffeuring kids around, and so on." (Robert Cervero)*

Gender

"At present, it would be fair to argue that here are no systematic gender inclusion procedures for transport either in terms of the training of professionals, the participation of users or the design and planning of systems, services and equipment." (Grieco and Turner 1997).

Addressing gender disadvantage in urban transport is at an early stage. Most transport studies and research to date have not even collected data that is disaggregated according to sex. This is the essential first step towards gender-sensitive transport policies.

"Transportation planning that considers the needs of men and women as separate user groups will lead to relevant services that more accurately meet the needs of all transport users, ultimately increasing the efficiency, sustainability and local ownership of transportation infrastructure investments" (World Bank (April 1997) Mainstreaming Gender in Transportation Projects: A toolkit. p. 4)



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"A study in Dhaka showed that 70% of the female garment workers surveyed belonged to poor households living in peripheral areas, not routinely serviced by transport services. They commuted on average 8 km a day, partly on foot, partly by bus, and sometimes by scooter." (quoted in the World Bank (April 1997) Mainstreaming Gender in Transportation Projects: A toolkit. p. 5)

Informal sector

Part of the mobility burden that is faced by the urban poor (especially women) relates to the lack of basic services in low-income settlements. Trips to collect water and dispose of waste may be burdensome in many low-income urban settlements and would be rendered completely

Preserving diversity and not over-regulating or creating unnecessary barriers to the informal provision of transport services is an important pro-poor policy. In addition, it will tend to help preserve the attractiveness of public transport by creating diverse options for travel between multiple destinations.

unnecessary by non-transport sector solutions, such as the provision of these basic services via piped water and efficient collection services (UNDP, 1998).

High densities and mixing of land uses were seen to be positive features that minimise the need to travel for the residents of low-income settlements. These features can be retained in upgrading exercises (including those involving land readjustment) rather than completely swept away by eviction and redevelopment. Unfortunately forced eviction and violations of housing rights continue to be rampant in many countries of the region.

Toleration of a vibrant informal sector also reduces the need to travel in many Asian cities by allowing many goods to be sold by mobile vendors, thus reducing the need for household shopping trips. Vendors who use non-motorised vehicles are often themselves poor and will be directly benefited by improvements to the street environment for NMVs.

There are also other important linkages through employment directly in the informal transport sector. In many low-income cities, this sector is a major employer. Policies that impact on this sector can have a major impact on employment.

Street activities and street space

The poor are particularly dependent on streets and public spaces. Traffic calming and similar approaches can reclaim public space to be used by poor and rich alike. Residents of low-income settlements often enforce their own bans on motorised vehicles or install speed restriction devices themselves, as for example in Surabaya's kampung where motorcyclists must dismount upon entering the alleyways.

📖 Alan Proudlove and Alan Turner, "Chapter 11 Street Management" in Harry T. Dimitriou and George A. Banjo" Transport Planning for Third World Cities" (Routledge, London and New York)

Other important street activities include trades and crafts (such as leather work or shoe-making), selling and marketing, entertainment and, in some cases, living. In many instances these activities are viewed as a blight on the city and an impediment to smooth traffic flow. But they simply reflect the state of the urban economy; they would not exist if they were not necessary. The economic life of the city may not be best served simply by providing traffic flow at the expense of a large section of the community.

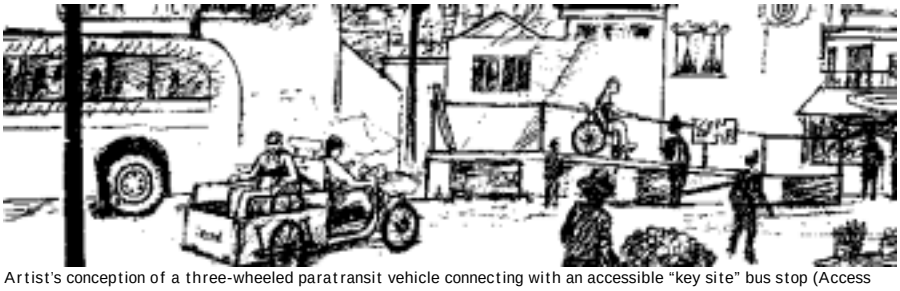
Obstruction of movement by street trading can be a serious problem. Humane solutions to the problem of street trading are essential and usually involve providing space which will not interfere significantly with pedestrians. Obviously, an adequate number of such spaces must be provided. But overambitious regulation should also be avoided; excessively complicated licensing systems or attempts to charge rents for trading creates over-bureaucratic administrative procedures and hence opportunities for corruption. It should be adequate to designate spaces where trading is allowed and where it is not.

Access for people with disabilities

✉ UN-ESCAP Social Development Division, Bangkok

Many of the improvements that come under the headings of pedestrian facilities or traffic calming will also increase the accessibility of the built environment for people with disabilities.

There are also many specific changes that should be made for people with disabilities, many of which would also make life easier for everyone, especially children, parents with small children, and the frail and elderly.



Artist's conception of a three-wheeled paratransit vehicle connecting with an accessible "key site" bus stop (Access Exchange International, "Mobility for All: Accessible Transportation Around the World")

Access to public transport

This is from "Access for Persons with Disabilities to Public Transit: Practical Steps for Less Wealthy Countries" - by Access Exchange International

Based on their successful use in different countries, here are some "first steps" towards the development of accessible transportation for persons with disabilities in less wealthy countries. *Some of these ideas are virtually without cost, others are very low-cost, while some are moderate cost. Not all are relevant in any given situation, but they represent "first steps" on the road to accessible transportation.*

No-cost or very low-cost

1. Access to the built environment: Advocate that all new construction of buildings and transit stations be accessible to disabled persons (kerb ramps, ramps to entrances, properly designed bathrooms, etc.). If it is possible to obtain legislation requiring such access, print and distribute recommendations, provide directories of facilities that are in compliance and encourage people to patronise them, etc.

2. Provide public transit information in accessible formats: Braille, cassette tape, and large print are examples.

3. Provide low-cost aides to assist semi-ambulatory passengers to use transit vehicles: examples include more vertical stanchions, well located handles on doors of vehicles, or steps or rails painted in "safety yellow". Note that these improvements would be welcome by all passengers!

4. If needed, provide larger print destination signs in buses to assist passengers with low-vision. Again, all passengers would benefit.

5. Train bus drivers to call out stops for blind passengers. If this is impractical on crowded buses, it may be more practical at off-peak hours.

6. Invite members of the disability community--and especially blind persons--to familiarise themselves with a bus in non-revenue service, to assist in boarding and riding on the vehicle when it is crowded.

7. Provide "travel tips" to the disabled community, concerning the times and places where vehicles may be less crowded.

Moderate cost

8. For door-to-door services, consider modifying taxis with ramps for use by wheelchair riders.

9. When obtaining new or replacement vehicles, consider low-floored models which are now used more and more in Western Europe and Canada. In all events, make sure replacement buses have wide enough doors to admit passengers with mobility aids such as walkers.

10. Consider ramped raised platforms at key stops to board buses and trams. A lightweight bridge can be attached to the platform, or it may be stored on board the vehicle (as is done in Curitiba, Brazil, and in San Francisco and Sacramento, California in the USA). The driver then positions the bridge to span the gap between the raised platform and the floor of the transit vehicle.

💻🖱 "Mobility for All: Accessible Transportation Around the World", an excellent introduction to this issue, with an international perspective, by Access Exchange International is now on the web at http://www.independentliving.org/mobility/index.html

11. Consider the installation of ramps or relatively low-cost wheelchair lifts on locally manufactured buses. Companies in the USA and elsewhere offer a wide range of products.

12. Perhaps side-cars or trailers can be attached to modified motorbikes or motorcycles, designed for use by a passenger riding a wheelchair. In some countries, this may be an alternative when lift- or ramp-equipped vans are not available. Non-motorised vehicles can also be modified to carry passengers with disabilities.

13. Consider a subsystem of buses dedicated just for use by persons with disabilities and elders. This is not ideal, but in extremely crowded transit systems it may be one answer to providing a transit option during peak hours.

14. Consider some variation of the "service route" concept developed in Sweden and now used in some cities in the USA and elsewhere. This system uses smaller accessible vehicles which serve all passengers on routes of special interest to elders and persons with disabilities.

15 Start with small pilot projects and learn from them. For example, make two key sites on one bus line accessible with raised platforms. In some cities, two Metro stations (eg at the ends of a line) could be made accessible by ramp or elevator. Start a small accessible van feeder service to the bus stops or Metro stations. Remember to check with disability groups to learn what they really need!

Accessible transportation is built over many years. Small projects capture the attention of the public, provide credit for transit agencies, and set the stage for public support for funding of larger projects in the future. Often such public support also helps transit agencies to develop a better community base for other funding as well. (Source: Access Exchange International).

Transport Demand Management (TDM)

📖 Yordphol Tanaboriboon, 1992 in Regional Development Dialogue Vol 13, No. 3

When we accept that it will be impossible to provide enough road capacity (or transport capacity in general) to satisfy the future "demand" it becomes necessary to find ways to make sure that demand is restrained to match the capacity that can be provided. We can also try to match demand to the level of traffic that is considered to be acceptable.

TDM policies include policies aimed at: increasing the average occupancy of vehicles; reorienting travel to off-peak periods; redirecting travel to less congested alternative routes; and reducing the total travel demand itself.

Photo: Craig Townsend

According to Phil Goodwin:

> *"…. solving congestion does not depend on building new roads, and indeed liberating our minds from this assumption has been an important step in allowing us to consider wider and more effective methods. I maintain that, broadly, we can do this, if we want, without increasing spending - or at least, without increasing taxation and public sector spending - because the cash flows already spent inefficiently on travel can be recycled in a way that reduces traffic and simultaneously improves the quality of streets, public transport and access to activities. And even if we decide not to use the price solution, reallocation of road space offers net benefits without high cost. I suggest that the policies which do this most effectively have converged with those that contribute best to environmental improvement, enabling a 'green-gold coalition' of environmental and economic advantage. I argue that - done properly - this enhances economic efficiency rather than diminishes it, and therefore provides the possibility of better material standards of living in a way which does not diminish the moral and spiritual quality of life."*

TDM examples

Various TDM policies have been tried in many places around the world, rich and poor.

- *Traffic calming in residential areas*

  Traffic calming, which includes a range of techniques and which was described earlier, is considered to be a form of TDM.

- *No drive days - according to license plate numbers (eg odd and evens or last digit)*

  Certain categories of vehicle are not allowed onto certain streets or into certain zones on specified days according to their license plate numbers. This has been tried in Seoul, Mexico City and recently in Manila. Not capable of fine tuning - often turned to in desperation in extreme cases or temporarily for special events.

- *"Planned congestion"*

  Deliberately imposing delays through traffic signals phasing and such like. Also, simply allowing existing congestion to remain in order to discourage further traffic growth. This is done as an unspoken policy in many cities. Other methods of tackling traffic growth and congestion are considered too expensive or politically difficult.

- *Auto-restricted zone in the city centre*

  Priority is given to pedestrians, cyclists and/or public transport within the most central zone of the city. Private passenger vehicles may be completely or partly excluded. Goods loading is restricted to certain hours. Many European cities have large pedestrianised zones in their old city centres.

- *Area licensing schemes (ALS)*

  Most famously used in Singapore. Private vehicles must either buy a monthly pass or a daily ticket to enter the central city during peak periods (or any specified period of the day). This has also now been tried in Teheran.

- *Vehicle ownership restraint*

  Private vehicle ownership can be directly discouraged by various mechanisms, such as through high taxation or through a quota system. Korea, China, Hong Kong, Japan, Singapore, and Denmark have all had strong measures to discourage car ownership.

- *Fuel taxes*

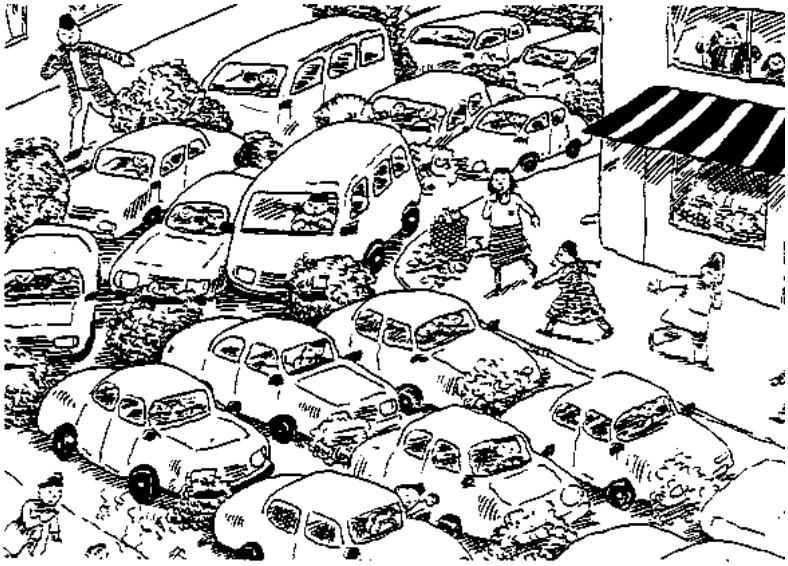
  Fuel taxes are the most common example of usage restraint - extra costs which vary according to the amount of travel.

- *Road pricing*

  A number of cities, including Singapore, are experimenting with road pricing in various forms. A more comprehensive system is envisaged often than just placing tolls on certain roads. The economic justification is also different, relating to the need to price a scarce resource (road space at peak times) to avoid its overuse.

- *Congestion pricing*

  Road pricing can vary according to location and according to time in order to send price signals which set the highest price on the most congested times and places in the road network.



GTZ Nepal

- *Peak period dispersion - staggered work hours, flexitime*

Many cities around the world are becoming more flexible about work times. Actually, many developing countries in Asia have long have extremely staggered work hours, so there may not be as much scope for this initiative in these countries.

- *Ride sharing, car-pooling, van-pooling*

Measures to encourage or facilitate increased occupancy of private vehicles, especially for the work trip in peak hours. Special lanes for high-occupancy vehicles (HOV lanes) are one such measure. However, if such a lane is simply added to a road then it is likely to encourage more rather than less traffic. Ideally, it would be taken from existing traffic lanes.

- *Parking policy*

Parking policies have a particularly promising role to play in Transport Demand Management (TDM). Such policies have been shown to be extremely effective in encouraging changes in transport behaviour. Parking supply policies include: encouraging employers to offer cash in lieu of free parking or to charge for parking; parking ceilings in new developments (rather than parking minimum requirements as is often the case); and on-street parking restrictions.

Parking Cash Out means that if employees who drive receive free parking, then employees who don't drive should receive transit subsidies or cash for those who rideshare, walk or bicycle. It's one of the most effective TDM strategies available, typically reducing automobile trips by 10-20%.

📖 Resources on "Parking Cash Out" schemes (thanks to Todd Litman for this list):

* The USEPA Commuter Choice Program, http://www.epa.gov/orcdizux/transp/comchoic/f98029.htm

* Don Shoup, "Congress Okays Cash Out," Access, Vol. 13, Fall 1998, pp. 2-8.

http://sacrates.berkeley.edu/~uctc,

* Win-Win Transportation Management Strategies, VTPI

http://www.vtpi.org

Can Road Pricing Ever Be Popular?

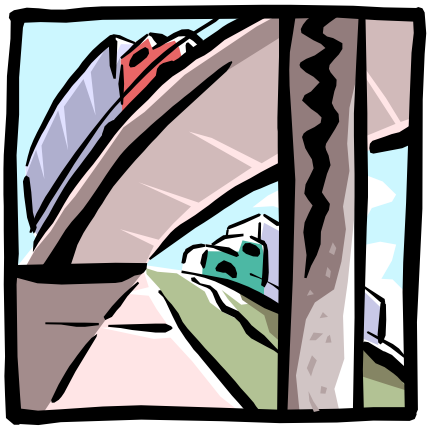
Many Pricing proposals, including road pricing, run into political obstacles because there are some losers!

The basic principle of road pricing is that users should pay the costs they impose on others. It is easy to demonstrate that this increases total economic efficiency, since only that traffic will arise whose benefits are greater than its costs.

However, there are then two groups of losers - those who are paying more money, only partly offset by extra speed and those who are now not enjoying a previously uncharged activity.

Goodwin et al. have proposed a RULE OF THREE to help make road pricing more politically acceptable.

From "Transport: the New Realism" by Phil Goodwin et al.



The road-space which is initially released by road pricing could be used as follows:

One-third reclaimed for environmental improvement, including pedestrian areas and non-transport uses.

One-third used for extra traffic, attracted by the speed and not deterred by the cost. It would be appropriate to make arrangements for this to favour high-efficiency and high-occupancy vehicles.

The remaining one-third for increased speed, especially at congested times, eg peak-period speeds to increase by 3-8 km/h. This will require the combination of pricing with other measures to reduce the tendency for traffic growth to offset any achieved speed increase.

The revenue could be partitioned in a similar way:

One-third considered as general tax revenue, either to reduce existing taxes or to increase social spending in accordance with local or national priorities.

One-third used for maintenance, and possibly new road infrastructure in locations again chosen in accordance with the varying national or local priorities. (The specific roads required will be modified by the existence of road pricing itself, and the effects of other policies).

One-third used to improve the effectiveness of public transport, by a suitable combination of fare and service-level improvements.

Equity issues in TDM and pricing policy

This section draws heavily from:

🕮 Litman, T. (1996). Evaluating Transportation Equity. Victoria Transport Policy Institute, Canada.

✉ Victoria Transport Policy Institute, http://www.vtpi.org

Mistaken equity arguments are often heard in the debates over TDM and pricing measures and it is vital that these debates be better informed. There are equitable and inequitable ways to introduce TDM.

It may seem on the surface that the poor will benefit from underpricing automobile through free roads, free parking, uncompensated accident costs, a lack of charges for environmental damages, fixed- rather than distance-based insurance and registration fees, and other related market distortions.

IN FACT, the opposite is true.

* Only a very small portion of long-distance, peak-period commuters are lower income. By far the majority of revenues are collected from relatively high-income drivers.

* The economic burden of such charges is also highly dependent on the availability of alternatives, including transit, ridesharing, bicycling, and flexible work schedules. Such alternatives are unlikely to develop unless there is a financial incentive for lower- and middle-income commuters to leave their automobiles at home, at least occasionally. Lower-income earners, and non-drivers in particular are harmed by the automobile dependency that results from underpriced automobile travel.

* The equity impacts of user charges depend largely on how the revenues are used. If congestion pricing revenue is used to benefit lower-income households, either by improving travel alternatives, by reducing regressive sales or residential property taxes, or through some sort of lump-sum rebates given to each household or individual (but not to each motorist), it is overall progressive.

Thus, full-cost pricing, including congestion pricing can be highly beneficial to lower-income and other socially disadvantaged residents if it is part of an overall program to encourage travel alternatives and if revenues are used progressively.

However, most current road pricing schemes are intended simply to raise revenue to build new highway capacity, rather than to encourage more efficient use of existing capacity. Dedicating revenue to highway construction contradicts most equity objectives.

Moving costs from up-front into usage costs

Many of the costs of owning a private car tend to be "sunk" costs. Most of the cost of owning, insuring and registering a car is usually the same whether you drive the car many thousands of kilometres per year or if you leave the car at home. **So the car-owner has every incentive to use the vehicle as much as possible - just to get their money's worth.** Proposals which address this issue include car sharing and the policy of switching to distance-based car insurance.

Car sharing

Recently there has been a very strong increase in interest and development of car sharing operations. Be careful not to confuse car sharing with ride-sharing or car pooling, organised hitch-hiking or vanpools.

Car sharing is an alternative system of car ownership, access and use - in which, for example, there might be roughly one car for every 10 members. In the larger car sharing operations, sophisticated booking and billing systems are used.

Car sharing is a relatively new but very promising and innovative way of providing access to cars but in such a way that a large proportion of

the costs are usage costs rather than up-front costs.

💻 Car sharing consortium:
http://www.ecoplan.org/carshare/

💻 European Car Sharing
http://www.carsharing.org/english/index.html

Car sharing makes efficient use of parking space and of the cars themselves. Most privately owned cars sit around unused for a large proportion of the time. This is a wasteful way to use a costly investment. By contrast, car share cars are in use for a significant proportion of the day and week.

Car-sharing operations seem to have highest potential in cities and towns with reasonably high density and in which the alternatives to car-use are attractive. Many Asian cities probably have high potential. Singapore has already launched a trial of car sharing.

A well-run car share project can have a number of favourable impacts: street space (parking), public transport patronage, a heightened sense of community, and even improvements in air quality and fuel savings.

Some car share projects claim that members (who previously owned a private car) reduce their car use as much as 50% without any reduction in mobility or convenience.

Public participation, transparency and good governance

According to the UNDP, "**good governance**" involves participation, rule of law, transparency, responsiveness, consensus orientation equity, effectiveness and efficiency, accountability and strategic vision. In the transport arena, efforts aimed at better governance are needed to correct both market failures and government failings, which especially impact on the poor.

The technical details sometimes blind us to the fact that ordinary people can and should be involved in debate on overall transport strategy

Although many of the details in transport planning are technical matters, THE OVERALL TRANSPORT STRATEGY IS ACTUALLY A POLITICAL DECISION IN WHICH THE PUBLIC CAN AND SHOULD BE INVOLVED. However, this fact is often hidden from the public (and even from politicians) who are given the impression that all transport planning should just be left to the experts. In fact, some of the most successful cities around the world are those which took a decisive political decision and adopted a new vision for transport - sometimes against the advice of the engineers.

Administrative disarray

In many cities, responsibility for transport matters and urban planning are divided among a large number of agencies with different priorities, subject to different pressures, and which are often at loggerheads. Bangkok's is perhaps the most notorious case of this problem. But many cities need to strive to establish an efficient and responsive system of administration for transport.

✉ The Urban Governance Initiative (TUGI), United Nations Development Program (UNDP), Kuala Lumpur.

Most responsibility for urban transport decisions is best held at the level of the city or the urban region rather than with national governments. Receptiveness to user needs will be more likely when responsibilities are decentralised to appropriate levels of government.

Transport decisions are prone to corrupt practice unless safeguards are in place

Strong mechanisms to ensure transparency and accountability are essential in order to reduce the likelihood of corrupt practice, such as improper influence on the award of major contracts, an ever present danger in the transport field in cities at all levels of income. Furthermore, meaningful participation requires a high level of

transparency and accountability of major transport decisions, which are currently shrouded in secrecy in most countries of the region.

Some decision-makers fear openness

Some governments and experts fear that an openness to participation will hinder decisive policy making. There is a traditional mistrust in transport planning of all community involvement, let alone involvement by the poorest people. However, experiences are showing that such involvement can be constructive and make public policies more likely to be well-considered, enforceable and free of corruption. Meaningful participation in transport planning decisions by stakeholders, with a special effort to hear those who are usually voiceless and powerless, can lead to workable solutions to otherwise intractable conflicts.

POOR COMMUNITIES ARE NOT UNREASONABLE!

Poor communities have demonstrated that they can be reasonable when treated fairly and sincerely but are very vulnerable and their range of choices is extremely limited. When consulted in a meaningful way, with the help of experienced NGOs, groups of low-income people have demonstrated the ability to state their interests, to appreciate many of the wider issues and to seek reasonable compromises. Documented cases that illustrate these points include negotiations involving the inhabitants of settlements along Mumbai railway lines and consultations with pedicab (cycle rickshaw) drivers in Dhaka about potential changes to their operating conditions.

Hearing the voices of the poor requires pro-active effort from relevant agencies

Non-governmental organisations and networks need to develop a much larger role in this pro-active effort in the transport sector as they already have in other sectors, such as in shelter issues. If the voices of the poor are to be heard more strongly in transport then decision-makers will need to become more receptive AND civil society will need to develop its capacity to tackle transport issues in a well informed way (and be assisted to do so).

One of the key aims of the SUSTRAN Network is to help community groups and NGOs get access to the information and assistance that they need to demystify transport issues and to tackle them in a pro-poor way. Without broad-based consultation, the main voices that tend to be heard by government on transport issues are the well-organised and wealthy lobbies for car users, the trucking industry, the motor vehicle industry, the oil industry, and the infrastructure construction industry.

Hearing alternative voices can also help to overcome the "**wind-screen view**" of transport problems by many urban transport decision makers. Most politicians, senior planners and transport engineers have little personal experience of using non-motorised transport or public transport as adults. This is particularly acute in cities where there is a strong polarisation between rich and poor. The transport planning professions are also highly male-dominated in most countries. This is a serious obstacle to a gender-aware approach.

Motorcycles

There is an urgent need for a wide-ranging debate on the role of motorcycles in Asian cities and the implications for the poor and for future policy options .

Small motorcycles are now within the reach of a surprisingly high percentage of households in low-income Asian cities, such as Ho Chi Minh City where it was estimated that by 1996 about 80 to 90% of households had access to at least one motorcycle and public transport use has dropped to only 2% of mechanised trips (MVA Consultancy, 1997).

A high prevalence of motorcycle use in low or middle-income cities is often associated with a poor supply of public transport (as in Vietnam, Malaysia, Indonesia, Thailand and increasingly also in India).

Motorcycles are problematic in many ways but do provide relatively affordable mobility. So what is an appropriate and equitable policy, taking into account long term synergies with public transport and with urban land-use patterns?

According to a study by the Road Safety Research Centre of University Putra Malaysia, motorcyclists constitute about 60 percent of traffic fatalities in Malaysia and their risk of injury is estimated to be 20 times higher than that of car passengers.

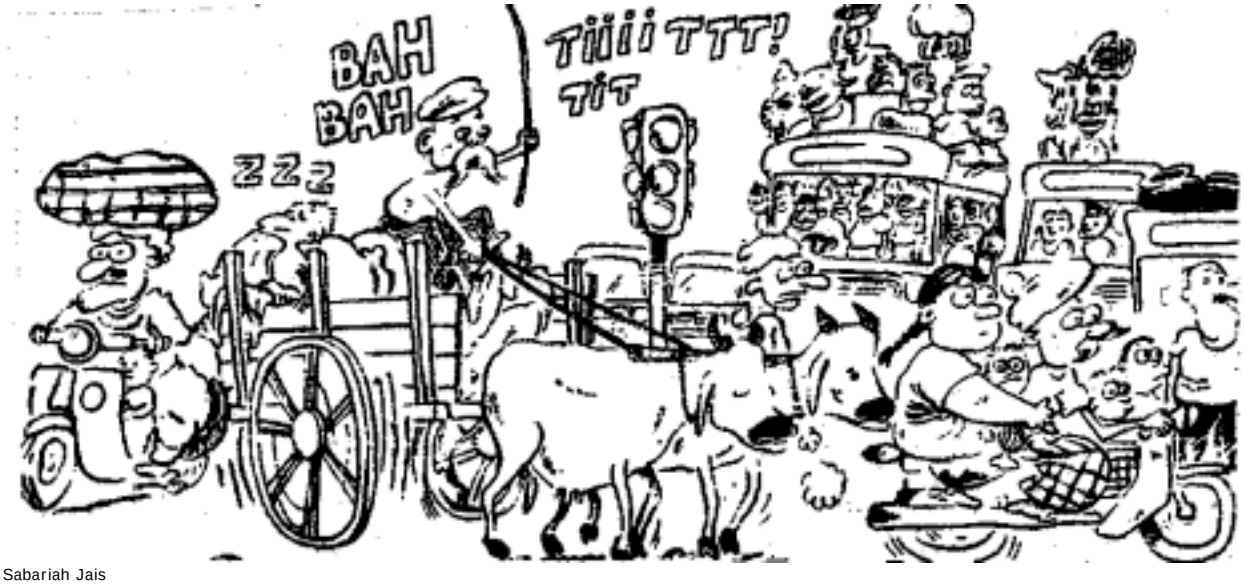
Would a policy of gradual restraint of motorcycle use have a disproportionate impact upon the urban poor?

Goods traffic

In high-income cities with high levels of car ownership, there is usually less freight traffic on the roads than passenger traffic. In developing cities and cities with lower car-ownership, the amounts of goods and passenger traffic are more nearly equal.

Goods transport is neglected in many studies of urban transport which tend to focus on passenger transport. Goods transport in low-income cities can be an important employer of the poor, for example in labouring jobs hauling goods on hand carts or by non-motorised vehicle. Efficient goods transport also effects the poor through its indirect impact on the prices of essential goods.

In many cities, goods vehicles are more strictly restrained than private passenger vehicles (for example through truck bans on major roads during peak periods or in some cases throughout the whole daytime period). This is despite the much greater importance of goods transport for economic development than the “luxury” of passenger transport by underpriced private passenger cars.



Sabariah Jais

Complementary NMV delivery services in Bogota, Colombia

In the 1970s, the Ramo bakery delivered products direct from the factory to 60,000 small shops in Bogota using 135 trucks, which often operated with partial loads and had trouble parking near their deliveries.

The bakery changed its distribution system so that a much smaller fleet of trucks were used to haul products to satellite warehouses, where a fleet of 900 cargo tricycles picked up the baked goods for final delivery. Total costs of the delivery system dropped by two-thirds from their previous level through this intermodal integration and differentiation, while expanding employment." (source: Replogle 1991)

The cart-pushers of Kathmandu

from the Asian Coalition for Housing Rights' newsletter, "Housing by People in Asia", No. 12, April 1999, which has several items on transport issues. Contact ACHR for more details about Nusha's cart-pusher study

Thelagada is the Nepali word for push-cart, an ancient means of transport which, along with donkey-carts and back-loaders, still carry goods around Kathmandu. In a city of narrow lanes and maze-like alleys, push-carts can carry goods where trucks can't, without polluting or using expensive fuel imports. *Thelawalas* work in teams of two, one steering and one pushing the load, and cluster around the city's wholesale markets, where a team can make 100 to 150 Rupees for carrying a full load of construction materials, grain, furniture or dry-goods one kilometre. They all rent their carts, on a contract basis, for 500 or 600 Rupees a month, and take home around 2,000 Rupees (US$35) a month, most of which goes to families back in the village, while the *thelawalas* sleep on their carts at night.

But Kathmandu's remaining 346 *thelawalas* are finding less space and greater dangers on the streets, increasingly filled with motor vehicles. A 1998 study on push-carts by Nusha Raj Shrestha blames a decline in push-carts on transport planning and investment in Kathmandu, which has focused on motorised transport, ignoring the needs of older, more sustainable forms of transport, like the *thelagadas*.

Beware False Solutions

It can be easy to be seduced by solutions that seem to be good ones but which may actually make things worse in the long run, or for the rest of the city.

Beware of short-term solutions that make the underlying problem worse.

For example, road-building and road expansion will be needed from time to time in all urban areas even as part of a balanced transport strategy **BUT** road expansion should never be touted as THE solution to all congestion or access problems. Massive expansion of road capacity may in fact make the underlying imbalances and trends worse.

Source: Roads of Doom

Beware of Quick Fix "Panaceas" or single solutions

In fact, **be suspicious of anyone who says they have a SINGLE SOLUTION to your town's transport problems**, whether the solution is a road, a mass transit system, "car-pooling", HOV lanes, ITS (Intelligent Transport Systems), a piece of technology, or whatever. Transport problems generally require an **integrated approach** involving various initiatives working together consistently over time.

Beware of nice rhetoric which does not match the real priorities. So watch the spending to see what are the real priorities.

Sometimes if the advocates of reforms in transport policy are successful, then the authorities will begin to adopt the same rhetoric. This is a good sign but don't relax yet! The nice rhetoric may not actually match the real spending priorities, which may be almost the same as before and just as focused on mega-projects, expressways, and private vehicles.

Beware of solutions that "save" your neighbourhood but push the problem onto another community.

Communities that are fighting a destructive transport project (such as an expressway through a residential area) sometimes declare victory when they succeed in getting the project diverted away from their neighbourhood. But this is a false victory if now another community will be destroyed. Often the new victims will be poorer, less vocal and less able to resist.

DON'T BE A NIMBY!

It is better to avoid NIMBY ("not in my back yard") approaches. Always seek alternatives that address the underlying problems and solutions that are good for society as a whole - not ones that just shift the impacts on to others.

Bangkok Post

Clean fuels and clean vehicles - essential but not a panacea

The promises of clean vehicles and clean fuels are sometimes held up as the panaceas to solve pollution problems from transport in cities. As mentioned above, no one solution is THE single answer. There are many other problems with transport besides air pollution.

Nevertheless, most countries **do** need to do more to clean up their fuels and vehicles if their cities' air is to become healthy again.

Examples of Clean Vehicle policies that work

There is perhaps no other measure that can improve air quality with such cost-effectiveness as the introduction of well run **inspection and maintenance programs**. Well-managed vehicle inspection and maintenance programs have been introduced in Mexico City with considerable effect. Such programs are needed as much for commercial vehicles as for personal cars and motorcycles.

Vehicle makers and the fuel industry tend to resist regulation to reduce emissions. Each says that the other should have the main responsibility to reduce emissions in the most cost-effective way.

Major responsibility for the quality of new vehicles lies with manufacturers and the regulation of **vehicle emissions standards**. There is much scope for further improvement in vehicles.

Cleaner fuels are also important. Both gasoline and diesel fuel can be reformulated to reduce emissions, but the greatest reductions come from the use of other fuels. Compressed natural gas is a much cleaner vehicle fuel. Refuelling is a major problem, but less so for fleet operators who can provide the necessary equipment. Other alternative fuels, including hydrogen, may also show promise in the future.

Is There Such Thing as a "Green Car"?

While technology can play a significant role in reducing some pollutants, the impacts of motoring are too numerous and too varied for any one technological breakthrough to solve them all.

Catalytic converters? Catalytic converters are devices connected to a vehicles exhaust system that can help reduce some emissions, namely nitrogen oxides, carbon monoxide and hydrocarbons by more than 75%. However, catalytic converters do not work until they have been warmed up making them ineffective for many short journeys. A catalyst can be inoperable for the life of a vehicle. In the absence of an emissions inspection program, this would never be detected. Furthermore, catalytic converters do not certain emissions (such as CO2 and evaporative emissions) and makes others worse.

The benefits of catalysts are likely to be eroded as traffic grows. Air pollution cannot be reduced to safe levels unless traffic growth is reduced. Catalytic converters also have negative side effects. They reduce fuel efficiency and consume large amounts of rare metals, the mining of which creates their own problems. The manufacture of catalysts consumes over 40% of the worlds platinum, almost all the world's rhodium and almost a fifth of the world's palladium.

Fuel efficiency? Fuel efficiency can be improved if lighter materials such as plastics are used instead of steel to make cars. But plastics are more difficult to recycle than steel and so create waste disposal problems. Furthermore, the trend towards much larger, heavier and gas-guzzling "sport utility vehicles" will erase any of these gains.

Alternative Fuels? Some people argue that we shouldn't be driving petrol or diesel cars at all, and that other fuels, such as methanol, ethanol, propane or natural gas would be cleaner. Many of the fuels proposed do produce less of certain pollutants. However, they often have other negative side effects. Burning methanol can produce formaldehyde, which is a suspected carcinogen. Ethanol production from organic waste materials takes land away from food production and can lead to soil erosion. Propane is only available in relatively small amounts. All of these fuels emit CO2 in quantities similar to that other fuels such as diesel and petrol.

Electric or Hydrogen Powered Cars? Electric- or hydrogen-powered cars are also sometimes cites as pollution solutions. This is not the case, as electricity has to be generated or hydrogen manufactured and currently both of these processes have substantial environmental impacts. For example, coal-fired power plants (particularly those that use 'brown' coal) produce substantial local and regional air pollution and greatly exacerbate smog and acid rain. Immense amounts of energy consumption and pollution are required to construct hydro-electric dams, and the resultant flooding of vast tracts of land displaces indigenous peoples and destroys often pristine ecosystems. Nuclear power generation has its obvious risks and the disposal of spent nuclear fuel poses grave environmental challenges to future generations. While these technologies appear to be ideal solutions, they merely remove the pollution from the tailpipe, placing them elsewhere, often creating greater problems in their wake.

So, even looking narrowly only at the environmental impacts of private vehicles, we find that **there is no such thing as a truly GREEN CAR**. This analysis has not even looked at all of the other social and urban impacts of unbalanced transport priorities. The only real solution is to reduce the priority on private motor vehicles. Otherwise, all gains from technology will simply be lost to increasing growth in ownership and use.

Adapted generously from: Friends of the Earth, Jan. 1996