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## Contents:

In this issue, busways are compared to light rail and metro systems. Financing and subsidies are discussed.

Resources, training, conferences

7, 8

2961

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## Busways Gain Ground

Early each morning, the people of Villa el Salvador, a town outside Lima, Peru, lined up at the depot and waited an hour and half for the bus to take them to work in the city center. Once on the bus, the luckiest found seats; the others stood the entire ride—which, although just 15 kilometers, took another hour and a half. At the end of the day, the trip was repeated.

In Lagos, residents from the suburbs wait at least 30 minutes to catch a bus and then ride nearly an hour for the 16 kilometer trip to the central business district.

In other large and spreading cities in the developing world, the numbers are similar, as are the results:

"Goods and services can't be delivered, business can't operate profitably, and the poor remain poor, because—among other reasons—they can't get to where the jobs are. Or, if they can, the trips are so long that only the most disciplined people figure it's worth it," says John Flora, an engineer and transport specialist at the World Bank.

In most developing countries, the economy depends a great deal on the efficiency of urban transport services, since between 50-80 percent of the national wealth is produced in cities. When transport is inadequate, everything suffers.

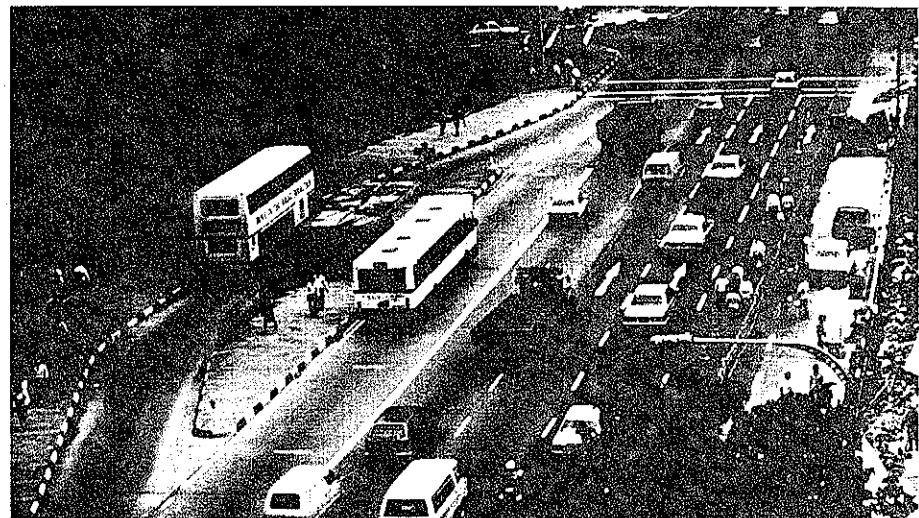
In cities with less than 100,000 residents, traffic is not so congested, and a reasonably good system of streets and buses can usually handle the flow. Once

over this size, however, cities generate more traffic of all sorts—more cars, trucks, buses, bicycles, pedestrians, even animals, all competing for road space. And authorities must figure out how to keep the traffic flowing. In cities with up to 1 million, good traffic management can solve most congestion problems. For those that are larger, other solutions must be sought.

Most transport specialists agree there is no one right answer, no single method to move people and goods. Instead, solu-

tions depend on each city's topography, shape, finances, and needs. And this can mean some or all of the various modes—including metros, light rail transit buses, and non-motorized transport, with some special right-of way systems, such as busways and bus lanes.

For the most part, authorities in large cities the world over are attracted to metro or light rail transit (LRT) systems, since these can move a great many people quickly and comfortably. And, under certain conditions—if there are enough



Credit: TTC

In Singapore, bus stops are set off from the roadway (which allows other vehicles to pass those stopped for passengers), and are designed to accommodate many passengers at once.

riders and if cities can afford the billions needed to construct these systems (as well as the millions to operate)—they may be the correct choice.

But, even where they cannot afford to build or operate them, politicians still prefer these state-of-the art systems to the more traditional, less sophisticated modes, such as buses.

### Busways vs. LRTs/ metros

Transport specialists, however, see other issues, as well as alternatives. They argue that metros currently cost between US\$50-\$150 million per kilometer to build, and LRTs run between US\$8-\$60 million a kilometer (these figures include depots and rolling stock), depending on whether they are elevated or located on the ground. Further, operating costs run from 10-25 cents a kilometer, per rider.

They insist that until ridership grows to such a point that authorities have no other choice but to introduce the super-expensive options, other transport systems—specifically those that rely on busways (roads or parts of roads that are completely segregated from other traffic), bus lanes, and traffic management—can be efficient and comfortable at a fraction of the capital costs of the other two. Busways are roughly US\$1 million a kilometer, when constructed at ground level, or US\$10 million, for elevated stretches, and between 2-8 cents a kilometer per person, to operate. Even when the costs of buses, terminals, and depots are added, the overall expense is far less than for either light or heavy rail.

According to a report by the Overseas Unit of the UK Transport and Road Research Laboratory (TRRL), some cost comparisons are available, although generally from cities in the developed world. In Ottawa, Canada, for example, a study found that the investment needed to build a busway would be just 68 percent of the price of an LRT. In Pittsburgh, U.S., the busway cost \$5 million a kilometer on one corridor and \$10 million on another, while the city's LRT was \$27 million per kilometer. Such variations are not unusual, the report explains, because costs depend on the degree to which streets need to be reconstructed, utilities diverted, and elevated sections built.

With regard to cities in the developing world, in a study of Lima, Peru, Mr. Flora

found that 50 kilometers of busway could be constructed for less than 15 percent of the cost of just 20 kilometers of metro, and provide far greater coverage. In fact, the government had already approved a metro and built the structural supports; but authorities are now reconsidering the sums that will be required to complete the project and the number of riders to be served (the former is much higher and the latter lower than had been originally estimated), and are deciding whether to use the structures to support a busway, instead. In the future, if demand increases beyond the point where a busway can give adequate service, the roadway can be converted to a rail system.

According to Philip Cornwell, a transport consultant working with TRRL, one reason busways are so much cheaper than either heavy or light rail systems is because the stretches are shorter: The segregated sections of road only need to be built where there is a great deal of traffic. Once congestion lessens, buses can circulate on ordinary roads. By contrast, LRT track must be constructed from one end of a system to the other.

Further, LRT systems need depots to house and maintain the cars which must be situated at the end of each line. Buses, however, can be housed in depots located wherever land is cheapest.

### Busways: What are they?

Busways were first built about 20 years ago along three major corridors in Lille, Belgium, and in Runcorn, a new town in Great Britain. In Runcorn, the town actually developed around the busways, which led to the main shopping area in the city center. In the late 1970s and early 1980s, busways were also introduced in various cities in Brazil, Peru, Mexico, Puerto Rico, the United States, and Côte d'Ivoire, and have since been constructed in France, Germany, Japan, Turkey, Colombia, and elsewhere. At present, they are being planned for major cities in Chile, Thailand, Indonesia, Pakistan, Kenya, and People's Republic of China.

According to most transport specialists, when bus systems are well designed and managed and the vehicles are well maintained, buses can achieve the same speeds as LRTs, move almost the same amount of people (between 20,000-

30,000), provide the same comforts, offer much greater flexibility, and cost dramatically less. That many buses do not offer the same amenities, are unreliable, and highly polluting, is largely due to poor maintenance—a practice that can be improved, given the right conditions.

Busways are segregated from other traffic by walls, curbs, or fences, but often run at ground level and thus intersect with city streets. They are quite different from *bus lanes* which are merely parts of streets designated for bus use only and not physically separated from the rest of the road. Thus, cars and trucks often enter the lanes; and because enforcement is generally weak, the goal of providing a quick track for public transit is thwarted. *Minimize*

The physically separated sections may be erected solely in the area of the bus stops, they may run short distances in the most congested areas of the city center, or, as in a number of cities (such as in São Paulo, Brazil and Lima, Peru), they extend many kilometers along the entire length of major traffic corridors that link the central city with the suburbs. *Prepare*

Most often, they are carved out of existing road space, run down the center of streets, generally consist of two lanes (although they may even be four lanes wide, as in Bogota, Colombia), and can accommodate both one- and two-way traffic. Less frequently, they are located along the curbs. In some cities (such as Belo Horizonte, Brazil), they were constructed at the same time as a new major road was built between the suburbs and the central business district.

At the end of the busways, in the central cities, there are usually large terminals that allow many buses to discharge passengers simultaneously.

Occasionally, busways have been set up to handle only *trunk* lines, such as in Curitiba, Brazil, where buses that use it run back and forth on the main corridor, much as a metro or LRT, and passengers connect to non-motorized modes or *feeder* buses that link up at various points along the way.

Some cities have gone to the added expense of building elevated sections, either where congestion is heavy, at busy intersections, or where existing streets would not have been large enough to

handle other traffic if lanes had been removed to make room for the busway.

### Benefits

Based on the experience of two decades, busways have much to offer. Probably the greatest advantage is their price: Because construction and equipment costs are so much less than LRT or metros, cities can more easily afford to build and maintain them—without accumulating huge debt or siphoning off funds from other badly needed services.

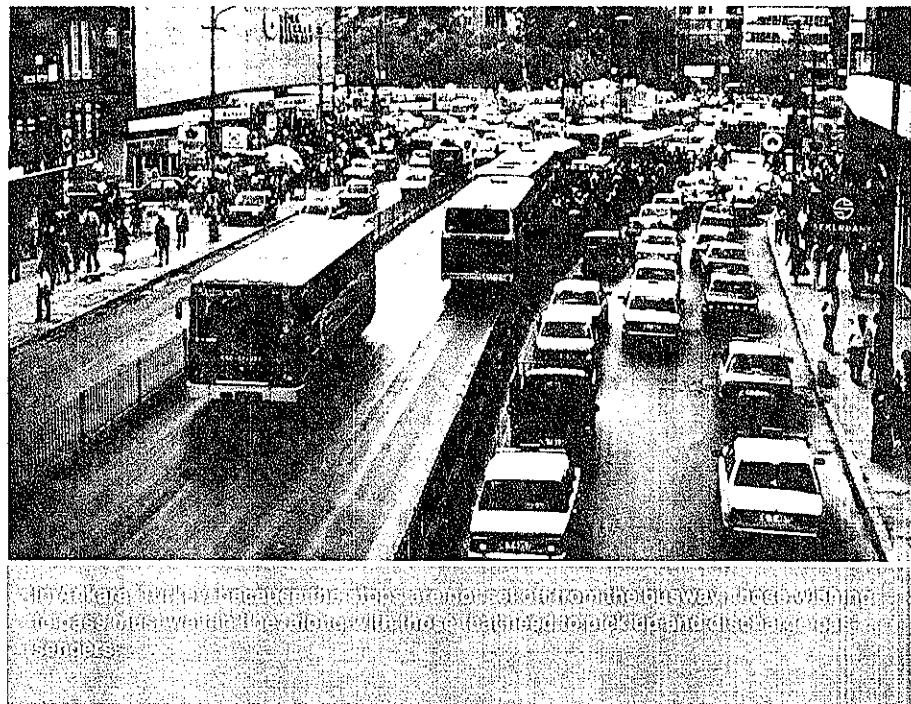
With regard to speed, if buses can pass each other, if bus stops are not too close, are properly organized, and are set aside from the roadway, buses can move as fast as LRTs: For example, the TRRL study found that buses can travel up to 25 kilometers an hour (kph) during peak traffic and while LRTs move from 19-28 kph.

Mr. Flora explains that when speed is increased, the same number of buses can make more round-trips from the outskirts to the center, in less time. Speed is crucial because it directly affects the number of people that can be transported in a given time—and this is particularly important to those who live on the outskirts of cities and have no other way of getting to work. In Villa el Salvador (outside Lima), for example, a trip that previously took one and a half hours was cut to 20 minutes. In Porto Alegre, Brazil, speeds rose from 6 kph to over 20 kph, although these numbers have recently dropped, as more and more buses are using the busway.

The added trips per bus are important in cities where fares are so low that bus companies cannot afford proper maintenance: When older buses break and cannot be fixed, they are permanently removed from service. But, because companies frequently cannot afford new vehicles, this represents a net loss to the system. Thus, riders wait even longer for the few buses that still operate.

*Mr. Flora* Mr. Flora stresses that increased speed also benefits bus owners: Busways allow vehicles to run more efficiently and, in so doing, cut operating costs substantially. Because buses can move at a steady pace, they consume less fuel and experience less wear and tear on the brakes and frames. Moreover, because busways tend to be better maintained than other roads, vehicles have a smoother ride and thus need fewer repairs.

Credit: TRRL



In order to use the new structures, many cities require bus owners to purchase special permits. But, according to Mr. Flora, the fee—which is then used to cover the cost of maintenance and police enforcement—does not appear to be an obstacle. "Bus owners are well aware of the various benefits and are therefore willing to pay the charges," he says. (He adds that an even greater benefit could be gained if authorities required busway vehicles to be inspected).

Once bus companies lower operating costs, some can afford to buy additional vehicles or to maintain their current fleet better. Mr. Flora notes that such cost cutting is important, because in many countries, bus companies are not allowed to raise fares—since authorities want to keep the rates affordable to as many as possible.

Another advantage to the busway scheme is its flexibility: Buses that follow different routes can enter and exit at any point along the way, and offer passengers a direct ride that does not require transferring to another bus or train. In Sao Paulo, for example, buses following 150 different routes operate on different parts of the busway. Further, different types of service can operate simultaneously—express and local, standard and luxury—along with different types

of vehicles, such as single or double decker, or articulated (elongated) buses.

Moreover, bus service can be reduced or increased during the day to match demand (more easily than can be done with metros or LRT). And, when ridership increases over time, cities can extend the stretch of roadway, as needed, when they find the funds to make the investment. In this way, additions can be made incrementally, which means less drain on the budget than with heavy or light rail systems, where large outlays occur at once.

TRRL researchers also conclude that busway projects can begin fairly quickly and proceed in stages, once authorities obtain the necessary rights-of-way. Further, the report notes that better buses and equipment can be introduced, and service can be upgraded, progressively, as resources become available, as ridership rises, and passenger expectations and incomes increase.

In the same way, the infrastructure can be constructed in such a way that the roadway and stations can be converted to rail at relatively minimal cost. Such is the plan for a large, segregated busway network in Karachi, Pakistan. According to Neil Boyle, a senior financial analyst at the World Bank, "the plan fits with Karachi's current growth and projected income levels. For now, the city needs

and can afford a busway system. But as the city is growing, authorities have to think about eventually moving to a system that can carry more riders. And the project provides a way to go from one solution to another." Construction will begin in 1993, with the provincial government responsible for financing and administering the project.

Mr. Boyle adds that if a city such as Karachi does not adopt a busway system, but instead, decides to wait until it has the funds, riders, and income level to support a rail system, then the movement of people and goods—in the interim period—breaks down.

Mr. Flora explains that busways can originally be designed to include the space needed to hold the additional equipment and cross ties for a railway. Equally important, at the time the busway is conceived, authorities reserve the rights-of-way, which would probably not be available at a later date. Then, when the conversion to rail occurs, the busway can be closed at night to allow the rails and overhead electric lines to be installed and construction does not disrupt regular bus service.

He adds that some future busways will be built to handle electric buses, since these create far less pollution: Although they are initially somewhat more expensive, cities are beginning to understand they can't afford *not* to take this path.

Richard Scurfield, an urban transport specialist at the World Bank stresses that cities weighing the benefits of electric buses should consider the alternative of replacing the old, polluting engines on the existing bus fleet with new ones—as this might be the most cost-effective solution. Further, he notes that research to improve traps (which are attached to engines to eliminate particulate emissions) is advancing rapidly and within the next few years, the traps may go a long way towards solving the problem of black smoke.

Busways also promote *road discipline* where little existed before. Mr. Flora explains that private buses compete for riders and routinely try to pass each other to reach potential passengers, first. They also stop wherever they wish, to pick up riders, regardless of whether they are waiting at designated stops. On busways, however, drivers must abide by the rules,

or lose their permits. As a result, overall safety can be improved.

He notes it is relatively easy to ensure that only licensed buses use the busway, since they are marked in a particular manner or painted in special colors, and are thus easily identified. Moreover, bus operators help police catch violators. "They obviously have a vested interest in doing this, because competitors who have not paid for licenses have an unfair advantage," he says.

### Drawbacks

Observers point out that busways are not without disadvantages—although, according to those who favor them, the problems can be resolved.

Chief among these is that busways cease to be efficient when they reach capacity, a problem that occurs on corridors running through areas experiencing rapid growth. At this point, too many vehicles begin to hamper the flow. Moreover, accidents begin to occur with greater frequency, because more conflicts arise between people and buses: In Porto Alegre, for example, about two people are killed each month, and many more are injured.

"The problem is that as demand grew, many buses were added along one corridor. As a result, there was less space between vehicles; and as they move quickly, they hit people who try to cross the busway in the middle of the block. Even where fences were erected, people pulled them down," says Mr. Flora.

Another drawback is that although busways provide the infrastructure that allows the vehicles to move swiftly, the service in some cities may still be uncomfortable and unreliable—since this depends on the quality of the vehicles. Whether publicly or privately owned, buses are often old; and, if not well maintained, they move slowly and break frequently. Moreover, with fewer buses circulating, they become overcrowded.

In addition to problems relating to comfort, old, poorly maintained buses are a major source of pollution, spewing out large amounts of black smoke that have both short-and long-term health and environmental effects. For this reason, many authorities prefer LRTs, since the vehicles are electric-powered.

Further, different aspects of the system may lead to bottlenecks. For example, buses with narrow doors (mainly on the smaller, private equipment) slow down the flow of passengers boarding and leaving. In the same way, if capacity is exceeded (a problem mentioned earlier), buses will be stacked up at the stops—as many as 20 in a line—waiting to discharge or take on passengers.

Some observers note that busways are not as popular with administrators as are heavy and light rail schemes because they require a good deal more coordination among agencies: For example, regulations and standards must be set by one department, another collects fees for permits, police must enforce regulations, and public works must build and maintain the roads, bus stops, and central depots.

However, others observe that the same agencies are already involved in normal street construction, maintenance, traffic management, and enforcement; and handling busways is not all that different. "What's true is that the LRTs or metros tend to be run by one agency, so their administration seems less complicated than for busways," says Mr. Flora.

Another reason for the attractiveness of heavy and light rail systems is that companies that build and supply them often lobby hard to promote them, and underestimate the actual costs—which have almost always far exceeded original estimates (see *the Urban Edge*, Vol. 14, No. 1).

### What works best

In 1989 and 1990, TRRL researchers studied busways in eight cities to determine which systems were effective and why. In general, they found the following:

- Various systems were able to carry up to 20,000 passengers per hour in each direction at about 18-20 kph. But, they concluded, each of the systems operated under less than optimal conditions; and if improvements were made, they could accommodate up to 25,000 riders. They point to Porto Alegre, where buses move in a fixed order, and the system carries up to 26,000 passengers in the morning peak, and 18,000 in the evening rush hour.

- Barriers separating busways from the rest of the street need to be made of sturdy materials, such as concrete. Where only fences were installed, people regularly destroyed them to avoid walking to the designated crossway.

- The best designed bus stops are those that are set on shoulders, off the lanes on which the buses travel, as this allows buses to pass others that have stopped for passengers, and also enables express buses to move at a good pace.

- Bus stops must be long enough to handle many buses without causing long back-ups. To achieve this, the bus stop needs to extend over a fairly long space (as far as 400 meters), and some passengers dislike the long walk to the exit. However, observers point out that in some of the world's most noted metro systems, passengers must walk long distances when changing lines or exiting. Mr. Flora notes that in Bogota, stops have been well designed, preventing buses from piling up. Buses traveling different routes stop at different points, several hundred meters apart from the others; in this way, several buses can load and pull off all at the same time, rather than having to wait.

- Where tickets are purchased in advance, at kiosks, shops, or post offices—as is already the practice in cities throughout Europe—passengers can board much more quickly. Conversely, where they pay inside the buses (as in Ankara, Turkey), boarding is delayed, and the number of riders carried is substantially reduced.

### Environmental effects

To the degree that busways decrease or limit the growth in car use, pollution from emissions will be reduced.

However, observers insist that busways alone, without other incentives such as high fuel taxes and license fees, will seldom discourage people who already own cars from driving them. But, according to Mr. Flora, there is evidence in Bogota, for example, that the busway, which offers quick service, has kept some people from switching to cars, which then add to traffic and pollution.

In addition, authorities can require that bus owners who choose to operate on the busway meet strict standards—and this can be an effective way to reduce pollu-

tion. Mr. Flora explains that although safety and emissions regulations exist in most countries, for several reasons, these are usually not enforced on city streets. "Because authorities do not allow owners to raise fares, cities are in a weak position to dictate what kinds of buses they use or to enforce strict standards—especially when bus owners have formed powerful lobbying associations.

"But when a city commits itself to build a busway to improve public transport, it also makes a commitment to improve the quality of the transport. It can then license and regulate which buses will be permitted to use it; if the bus owners want to move passengers in 20 minutes instead of 90, and increase their profits, they buy licenses and agree to inspections."

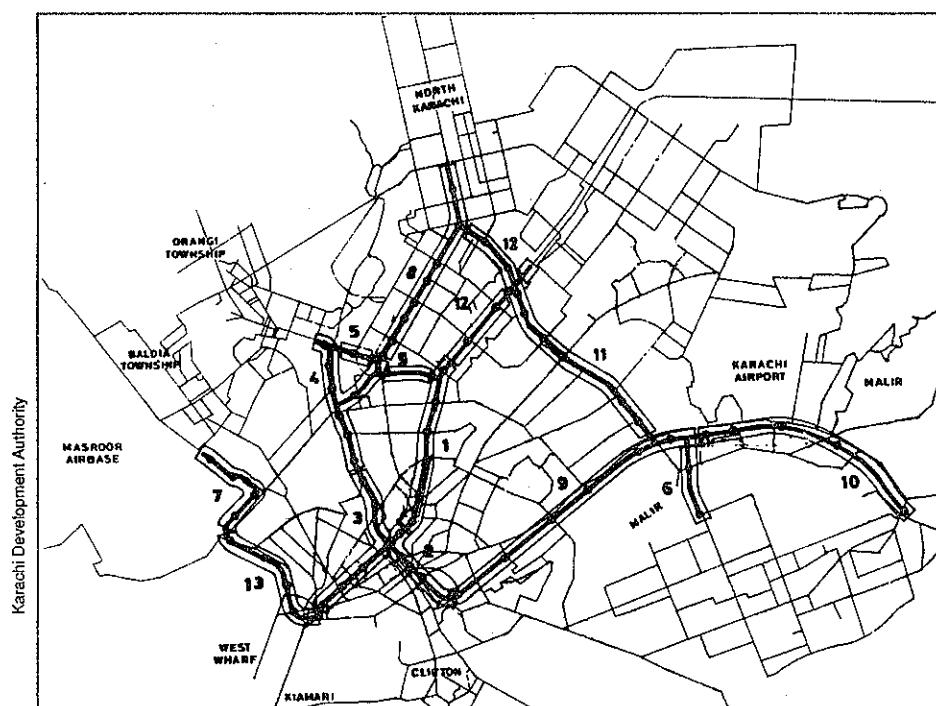
In the cities where busways operate with modern, electrically-powered trolley buses, the environmental benefits are even greater. Mr. Flora points out that electric systems need not be owned

solely by public companies: "In Santiago, the plan is for the government to own some of the stock. But an autonomous authority, say, the one currently operating the metro, will build the transitways and the electric supply company will install the overhead wires. And individual operators, either cooperative associations of owners or individual companies, will buy and operate the rolling stock. Although the new trams cost about 50 percent more than buses, the difference should not be an obstacle."

Until now, the TRRL studies have not been able to determine the busways' effect on congestion. The report notes that generalizations are not possible, since the situation depends on the capacity of the road space to handle regular traffic, whether road space is reallocated, or if new capacity was provided.

### Financing transport services

Most observers agree that the costs associated with building busways, roads,



Following a study financed by the World Bank authorities in Karachi, Pakistan, have launched a 25-year transport plan that includes an 87-kilometer network of busways (the thick lines on the map) to serve the city's population of about 10 million. The busway corridors, shaped somewhat like a fan, radiate from the city center. There will also be connecting links between the radial lines in the outskirts. Where necessary, sections will be elevated. The numbers (from 1-13) indicate the order in which the various sections will be built.

and light and heavy rail systems, will have to be borne by governments (either the central government or some combination of central, provincial, and local). Operating costs—which include maintenance, police efforts (to enforce that only those with permits use the busway), and inspections—should be covered by the permit fees.

But, Mr. Flora stresses, the way that bus service is financed must also be considered, since busways are merely one element in a public transport system. "Ideally, financing should be provided by the private sector, at no cost to the government. The problem is that a major segment of the population can't afford fares that fully cover the bus owners' true costs and allow for some level of profit, as well. Thus, it's critical that we find some way to make public transport affordable to the majority of the population in developing cities—most of whom have low incomes," he says.

Various methods have been tried and most experts prefer to design subsidies aimed at particular groups. In Brazil, for example, industries provide their workers with reduced-price bus, metro, and railway tickets: Companies buy these from the government and then sell them to employees, who pay no more than 6 percent of their salaries (although the actual fares are quite a bit higher). Employers then claim this cost as a business expense, which is deducted from their annual taxes.

The problem, however, is that these subsidized tickets are only provided to employees in the formal sector, which is approximately just 25 percent of the workforce. For the others, no such plan exists, largely because no one has been able to design a mechanism.

Mr. Scurfield agrees that, in general, targeted subsidies are best, since blanket subsidies, which are almost always directed to public or quasi-public bus companies to cover operating costs, tend to promote inefficiencies: Because the companies rely on these additional sums, they are not forced to economize, and do not monitor operations the way they would if no extra funds were available. For this reason, they don't cut back on service or superfluous staff when this is warranted.

He adds that blanket subsidies are more costly (than targeted ones), and, because most governments are strapped for funds, they will have a difficult time finding the necessary finances.

He notes that subsidies could be targeted more efficiently to groups that need them if they were distributed through existing institutions that provide social benefits of one sort or another. For example, the elderly and disabled, as well as low-income families that receive social assistance, could buy reduced-fare transport tickets, just as they buy food coupons (which serve as cash, for food purchases). But such schemes would be limited to cities where such agencies exist—which are relatively few.

Authorities could also give free travel cards to some categories, such as the elderly, to use in off-peak travel times (this is already done in many developed countries).

In some cases (as in the U.K.), authorities decide that certain sparsely populated areas should have bus service. Thus, they contract with a company, for a fixed fee, to provide a specified number of buses each day or week to the area. Mr. Scurfield says this type plan could be applied to squatter areas, as well: People living there would pay reduced fares, and the government would contract with a bus company for an agreed upon sum to provide a certain amount of service. He adds that authorities would have to monitor the program to ensure the bus company adheres to the contract. Such a plan has not yet been tried in developing countries, although some are considering it at present.

Another scheme is to provide reduced-fare tickets to students through schools. For schools located in very low-income neighborhoods, tickets might be provided at no charge. Once collected, bus companies would redeem them with the government.

Mr. Flora notes that although targeted subsidies are preferable, the process can be very expensive and complicated to administer, since it invariably involves several different institutions. Further, when a substantial number of agencies are involved, the possibility for inefficiency and corruption increases. Moreover, such schemes still don't reach all those who might be eligible.

Thus, to overcome these problems and promote the use of public transport, he believes it is best to subsidize all users of public transport with fares set at prices that are affordable to the majority—to enable the public to get to jobs, health care, schools, and other activities. Once authorities determine what the fare should be, tickets could be sold at various locations, like post offices, banks, kiosks, and the like, and the revenue would be turned over to the transit regulatory authority. (When the private sector sells them, owners would get a small percentage of each fare for providing the service). Bus operators would collect the tickets and authorities would reimburse them at a predetermined amount based on efficient operating costs, plus profit.

"It's best to base subsidies on the number of passengers carried, because it gives bus operators the right incentives. Without such motivation, operators might just take the subsidy and not provide the service. In one country, for example, the subsidy was in the form of free gas, and the operators sold it, instead of carrying passengers," says Mr. Flora.

In the subsidy scheme described above, the government covers the difference between the ticket price (what the passenger paid) and the amount paid to the bus companies. Mr. Flora explains that the funds needed to support these subsidies should be taken from the transport sector, directly—that is, from license fees and automobile and fuel taxes set at appropriate levels (which, he adds, are often too low). Cities could also charge *congestion fees*: Drivers who wish to bring their cars into the city center must pay a higher fee for a special license plate.

The issue becomes one of ensuring that those without proper licenses are fined. At present, this is difficult to accomplish, for administrative and political reasons. But, new technology now being tested in the U.K., the Netherlands, and Sweden, may help cities enforce the program: Special electronic cards, for which drivers pay a fee, are placed in a car's front windshield; and electric scanners, located on major corridors leading into the city center, electronically identify those vehicles without the cards, in order that owners can be fined. **UE**

## RESOURCES

Md. Abdul Quader Miah and Karl E. Weber, "An Affordability Dynamics Model for Slum Upgrading," Human Settlements Development (HSD) Monograph No. 20, Asian Institute of Technology, P.O. Box 2754, Bangkok 10501, Thailand, 1990.

Using a random sample of 750 households in six slums in Dhaka, Bangladesh, the authors examine housing affordability among urban slum dwellers.

This study traces the relationship between affordability, income, and housing; identifies several key determinants for low-income households, and arrives at an econometric model for measuring the ability of slum dwellers to bear the costs of improved housing and related services.

Variables related to affordability include household income and savings, house prices, tenure, location, house characteristics, the local environment, market conditions, local laws, available financing, non-housing expenditures, and remittances to relatives living elsewhere (usually a rural village). Household factors to be considered include age of the head of household, household size, education, and duration of residence.

The authors designed their model to accommodate the current trend toward self-help housing and improved cost recovery. They use numerous variables to measure affordability and assert that other models have not done this, and have thus overlooked the constraints of the poorest residents.

Another study, "Potential for Slum Upgrading Among Owners and Renters," was produced using the same data.

Denis Murphy, *A Decent Place to Live: Urban Poor in Asia*, Asian Coalition for Housing Rights, Habitat International Coalition-Asia, P.O. Box 24-27 Klongchan, Bangkok, Thailand, (\$6 for Third World, \$10 for First World), 1990.

In this publication, the author presents the views of poor people on urban life and housing problems and advocates for their rights. It was produced following

the 1989 conference of the Asian Coalition for Housing Rights in Seoul, Korea.

In the introduction Mr. Murphy asserts that, if Habitat's "Global Strategy for Shelter to the Year 2000" is to succeed, governments must remove laws and penalties that prevent poor slum dwellers from improving their houses; authorities must also protect people from eviction and allow them to own or lease the land on which they live for at least 25 years.

A large section is devoted to interviews with squatters, pavement dwellers, low-income tenants, and prostitutes from Bombay, Hong Kong, Calcutta, Manila, Bangkok, and Seoul.

Phenomena common to all cities—including evictions, housing solutions, informal employment, and people's organizing efforts—are also discussed. The author describes in some detail the People's Responsible Organization of United Dharavi (PROUD) in India, Zone One Tondo Organization (ZOTO) in Manila, the Society for Community Organization (SOCO) in Hong Kong, and the People's Organization for Power (POP) in Bangkok.

Ed., Bishwapriya Sanyal, *Breaking the Boundaries: A One-World Approach to Planning Education*, Urban Innovation Abroad Series Publication, Plenum Publishing Corporation, 233 Spring St., New York, N.Y. 10013, U.S.A., 1990.

This publication deals with the thorny issue of whether training and planning from the First World is working for the Third World. Its premise is that, despite the record influx of students from developing countries to attend American planning schools, there has not been any concerted attempt to develop a theory of cross-cultural exchange or to promote the transfer of substantive knowledge to developing countries. Essays are presented by 10 academics and professionals from developing nations who received their planning education in the west and hold posts in major North American graduate-level planning institutions. The authors critique their own education, research, and teaching experiences in western schools and discuss the need for changes in the planning curricula.

In his introduction, editor Bishwapriya Sanyal proposes "one world" planning as a progressive way of thinking about rela-

tionships between the developing and developed worlds. He writes that planners are at the beginning of a new stage, "...when the world will no longer be divided between knowledge producers and knowledge consumers but, instead, will represent a knowledge network comprising planning academicians from both rich and poor countries."

The authors, who present essays on the teaching of writing, environmental planning, statistics, qualitative evaluations, housing policy, urban and regional planning, transportation, and western planning education in general, do not all advocate a one-world approach. Some reject the concept, saying it is unsuited to a world marked by sharp disparities in income and political power. Others favor comparative methods, while some question the usefulness of comparisons between rich and poor nations' planning experiences.

In "Incongruities Between the Theory and Perception of Regional Development in Less Developed Countries: Toward Bridging the Gap," Hooshang Amirahmadi weighs in firmly against western planning models being applied to poor countries. He advocates comparative education (programs that cover rich and poor countries and compare experiences in the two) as a means to bridge the perceptual gap between the mainstream Western planning literature and students from less developed countries. To illustrate the differences, he cites the varied definitions for phrases such as "regional problems" and "regional development objectives" presented by his graduate students from Brazil, Haiti, Egypt, South Africa, Bangladesh, Iran, India, and elsewhere.

The authors agree that curriculum should evolve away from neoclassical economic models and that more emphasis should be placed on thinking critically and designing concrete solutions to urgent urban and regional problems in the developed as well as the developing world.

Ann Schylter, "Twenty Years of Development in George, Zambia," Swedish Council for Building Research, Stockholm, Sweden, 1991.

This publication presents a 20-year, time-series analysis (from 1969-89) of

George, a low-income settlement in Lusaka, the capital of Zambia. Six groups of about 10 houses each were investigated. George was upgraded and legalized in 1977, an occurrence that provided a solid basis for a "before and after" evaluation.

Schylter analyzes space and housing values, assesses the degree of commercialization and gentrification after legalization and upgrading, and presents comprehensive documentation of how the houses have changed, including photos and floor plans of individual houses, and maps of the settlements.

Prior to upgrading, residents lived in considerable hardship and were involved in hectic building activities. During upgrading, about half the houses were replaced. Then, in the mid-1980s, the incomes of many residents dropped and the services provided by upgrading deteriorated. More sub-tenants moved into the new, larger houses, leading to overcrowding, since outdoor open spaces were reduced. There were no clear trends toward commercialization or gentrification.

Overall, while housing standards became more diversified, upgrading and other planning and policy measures introduced during the 1980s did not significantly improve living standards in the area.

#### Publications Received

Asif Faiz, Kumares Sinha, Michael Walsh, and Amiy Varma, "Automotive Air Pollution: Issues and Options for Developing Countries," World Bank Infrastructure and Urban Development Department, Working Paper No. 492, the World Bank, Pam Cook, Rm. S10-063, 1818 H St., N.W., Washington, D.C. 20433, 1990.

This paper examines automotive air pollution in developing countries, which is intensifying with increasing urbanization and motorization, particularly in big cities in Latin America and Asia.

Chapters focus on air pollution characteristics; the role of motor vehicles in air pollution; damage done by hydrocarbons, nitrogen oxides, and carbon monoxide from land transport sources; motor vehicle emission standards and compliance experience; vehicle emission control technology; alternative fuels and ad-

ditives; traffic management and policy instruments, and implementation issues.

The authors conclude that simple policies that encourage clean fuels and better traffic management are the most promising approach to controlling vehicle pollutant emissions in developing countries.

#### CONFERENCES

The third session of the preparatory commission for the United Nations Conference on Environment and Development (UNCED) will be held from Aug. 12-30 in Geneva, Switzerland.

For details, contact UNCED, 160 rue de Florissant, P.O. Box 80, CH-1231 Conches, Switzerland.

"Landscape and Architecture" will be the theme of the international conference planned for Oct. 8-11 in Pinar del Rio City, Cuba. The event is being sponsored by the Cuban Union of Architects and Engineers.

For details, write to: Union Nacional de Arquitectos e Ingenieros de la Construcción de Cuba, Humboldt #104, esq. Infanta La Habana, Cuba CP 10400.

The theme of this year's congress of the International Federation for Housing and Planning (IFHP) will be "Urban Regions in a New Social, Economic and Political Context." To be held from Oct. 14-18, the congress will focus on sustainable development, the environment, changes in Central and Eastern Europe, and the effects of free market reforms on housing, planning, and urban environments. Berlin will be used as a case study.

For further information, contact IFHP, Wassenaarseweg 43, 2596, The Hague, The Netherlands.

#### TRAINING

Development Planning Unit (DPU), 9 Endsleigh Gardens, London WC1H 0ED, U.K.

DPU will hold two courses later this year at the campus of University College London: "Energy Management" (Aug. 22-Sept. 6), and "Environmental Institutions" (Sept. 5-20).

The courses on water and energy are aimed at high-level government and managerial staff. The one on environmental institutions is aimed at mid-level government officers and staff of non-governmental organizations, research institutes, and other agencies. Candidates must have practical professional experience.

For further information, write to the above address.

*Water, Engineering, and Development Centre (WEDC), Loughborough University of Technology, Loughborough, Leicestershire, LE11 3TU, U.K.*

"Infrastructure for Low-Income Urban Housing," a 12-week diploma course, is planned for Sept. 23-Dec. 13 at WEDC in Leicestershire. Class modules will cover: (1) preparation and management of housing projects; (2) water supply and sanitation; site preparation, access, and other services; and (3) low-cost buildings. Students will participate in a group project.

Candidates must hold a senior professional position in local government or in a housing-related agency, or hold a degree that qualifies them to work on housing in developing countries.

For more information, write to: The Course Tutor, Diploma course in: Infrastructure for Low-Income Urban Housing, at the above address.

*International Union of Local Authorities, P.O. Box 90646, 2509 LP The Hague, Netherlands*

"Getting the Most out of Your Human Resources: Local Government Personnel Training and Development" is the title of the course planned for Sept. 23-Nov. 15 in The Hague, with study tours in other Dutch cities and in Germany and Norway. The course will discuss and assess local government personnel training and development on a comparative basis in the three countries, with the aim of improving training programs and the performance of trainers.

For details, contact the Training Department at the above address.