TRANSPORTATION AND LAND USE IN THE DEVELOPING WORLD: PLANNING IN A CONTEXT OF CONTROVERSY

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Transportation and land use in the developing world: planning in a context of controversy.
THE ARGUMENT

Everyone agrees that transportation and land use are closely linked. The distribution of human activities over urban land creates travel demand carried by the transport system. The transport system, in turn, has significant impacts on the shape of the future the land use pattern.

Further, everyone agrees that the job of planning is to facilitate mobility (or stem its decline) for all groups in the metropolitan population in such a manner as also to reduce global warming effluents and local pollutants, reduce the consumption of fossil fuels and limit the urbanization of land currently in critical life supporting non-urban roles. In addition, most observers agree that the really forceful actions to achieve these goals, at least in the short and medium run, are action on transport itself, including vehicle technologies and the guidance of vehicle use, rather than on related systems such as land use.

But the role of land use in this effort is subject to vigorous debate. On the one side there is a highly committed belief that it is essential, at least for the long run toward achievement of these goals, to forcefully limit the decentralization of urban development and to design the composition and densities of land uses in such a manner as to shorten trips, and encourage socially responsible travel modes. This commitment is linked to a variety of actions that encourage increased land use density: pedestrianization, traffic calming, cycling, intensive transit service, parking policy, etc. These advocates are largely from the environmental design professions. On the other side are those who believe that sprawl does not significantly raise transport or infrastructure costs, and does not significantly increase pollution or fuel consumption. They argue that spatial decentralization is driven by worthy economic and life style advantages, and in any case cannot be significantly confined by any practical means. These advocates are in good part based on an urban economics platform, and on generalization from overall metropolitan patterns rather than composition of land uses at smaller scale. They emphasize that air quality improvements can only be significantly achieved by transport technology improvements to reduce effluents and vehicle use restrictions (such as congestion pricing).

It is important to understand that this is not a confrontation between those who care for the environment and those who do not. It is an argument about how to care for the environment.

This confrontation will not be resolved any time soon. There is relatively little communication between the two positions. They confronted each other in a revealing debate in the Journal of the American Planning Association (Gordon, Richardson and Ewing 1997), and on other occasions. Though both sides of the argument are well developed, it has been difficult to resolve the issues with comparable data.

It is important to note is that this debate has been carried out mostly in the United States and elsewhere in the north, where a number of issues have different shape than in the developing countries. For examples, there is a typical assumption that the population is basically universally motorized, that agricultural land is not scarce, that the production of serviced land (including transport) is not a priority for low income housing, that the vehicle stock is mostly recent models, and that transport decisions are not highly political and can be expected to prevail over time. All these assumptions are in question in much of the rest of the world.

This paper will argue that land use based urban transport planning is potentially much more important in the developing world than in the north.

The planning decision is whether to (1) attempt to plan land use to reduce trip making, shorten trips and encourage the use of transit while planning transport services and infrastructure to reinforce this intent or (2) to permit market forces, within only limited regulatory constraint, to determine the locations of travel demand and arrange transport policies and services to accommodate it, meanwhile depending mostly on vehicle technology and vehicle use policy to deal with environment.

Over recent years the balance of sympathy has steadily increased toward the first orientation, sprawl constraint, because of intensifying concern for global warming, local pollution, and congestion—both in the developed and developing world. The sprawl constraint view is intuitively more satisfying and provides more visible evidence of local...
public commitments. The environmental design initiatives are likely to be publicly influential as wholesome, directionally correct efforts, while more forceful vehicle use policies are perceived not within easy reach.

In any case, most text books on urban transport planning, in effect, tend to default to the second view—that of serving (some part) of demand where it appears—by assuming the land use plan/forecast was created by some prior initiative, so that the transport plan should simply serve the land use plan while postponing traffic management actions to a later implementation period. They also leave transport technologies and vehicle use controls with prospects of affecting the joint relationship between land use and travel demand as good ideas lurking at the margins of the effort because they are difficult to include within the central analytical system of transport planning. Even further, transport planners are often likely (for good reason) to question the optimism of the land use plan—e.g. if it anticipates full build-out of zoned industrial land or strives to contain development within a metropolitan perimeter. They are doubtful when land use planners have assumed considerable policy influence over land development patterns or undue optimism e.g. about the arrival of rate-paying businesses. Transport planners need to avoid the embarrassment of leaving some infrastructure segments underutilized while other corridors are bursting with congestion. For obvious reasons, transport planners tend to be much more conservative than land use planners as regards expectations of land use regulation.

An important goal of this paper is to argue that transport planning is a widely debated activity by different professionals and stakeholders, so that decisions on these conflictive matters need to be resolved on an item-by-item basis. There are no grounds for assuming that the planning process at large will uniformly accept either position in this. The process of decision on the plan elements debate is necessarily controversial. This makes the planning process in some ways more complicated and in other ways simpler. It is more complicated, of course, because holders of different positions argue on each issue. Some actors will attempt to persuade consistency among closely related plan elements, but contradictory features within the plan must be anticipated. Consider, however, that in some ways this makes the process simpler because the advisable action on a particular element is likely to be easier to reach than agreement in principle that needs to be applied to all actions—the individual actions are sure to vary in terms of agreement about the outcomes of particular choices, level of achievement in mobility or environmental benefit, feasibility, and so forth.

THE POSITION AGAINST SPRAWL

One issue is the definition of sprawl. Ewing (Gordon, Harrison and Ewing 1997) reminds that the issue is not overall reducing density based on an assumption of a monocentric city that declines to low densities at the outer fringe which might be created with some economic or lifestyle justification. Rather the matter is to deal with the problems of leapfrog or scattered development, strip development along transport routes, and large expanses of single use development. These are the things that are problems. Contrary to possible assertion, these offending forms of development are not always manifestations of popular preference, especially in the developing world.

Sprawl, by this definition is very widespread and extending explosively among cities of the developing world. It results in part from the fact that very large parcels are held out of development for various reasons. Urbanization is obstructed by large corporate holdings awarded or purchased for the (apparent) purpose of eventual development to sustain the land holder (e.g. Kuala Lumpur). There are holdings by government agencies, military authorities or religious foundations (Latin America) that cannot be acquired for development. There are jointly held lands that cannot be sold (e.g. the Mexican ejidos held by groups of agricultural peasants), or tribal lands that can only be developed through tediously pursuing the agreement of many elders (Africa). There are holdings of privileged individuals banking them toward higher eventual sale prices or simply holding them toward uncertain purpose, since there are no land taxes (Saudi Arabia). Obstructions also include parcels that are too small for development by the current very large scale of housing development companies (e.g. in Chile and in China). Development is sometimes scattered to achieve socially exclusive environments at the urban periphery (e.g. Bogotá). In China sprawl is engendered by municipalities that buy land at low prices from agricultural units and sell it at higher prices to developers.

Strip development along highway corridors that complicates traffic and results in inefficient land consumption is created during single decades of growth in Chinese cities as viewed in Landsat images of Webster and others (Webster et al 2003) and in cities across the developing world by Angel (2005). They give rise to an effort to build circumferential
highways to avoid congestion, but these too quickly attract strips of development. Such highways have become favored options without effective land use constraints in many countries. These strip-lined circumferential ways also figure prominently in the development patterns of Chinese cities. They result in many kilometers of congestion to traverse even small cities.

Decentralization results from a wide variety of effects and actions that need to be examined for specific metropolitan cases. In China, for example, this array includes:

1. Urban plans for dedensification and satellite development, to overcome very high central residential densities
2. New intercity highway construction without land use constraints.
3. Breakup of state-owned enterprises, resulting in the loss of their housing, forcing residential relocation at the urban fringe.
4. Very large scale new housing projects that can find adequately large parcels only at the fringe (though the project site itself may be quite high density).
5. Continued acquisition and urbanization of land by municipalities, which, in the absence of local land taxes, need to do so to have a stream of annual revenue.
6. National Land Management Act standards requiring movement toward controlled average metropolitan densities
7. The new fee frameworks specifically placing money value on land in declining gradient from center to periphery, resulting in the decentralization of low rent activities from central locations.
8. Strong downtown business influences creating conventional central business districts, where land uses were formally more mixed, and included housing
9. Rapid urban immigration of floating population without city center residential options
10. And, of course importantly, rising incomes and auto ownership.

China, of course, is a special case. But ultimately, every city is a special case and points of these kinds appear in all of them. My point is that by no means all the urban decentralization is created by households using their increased income and auto mobility to seek spacious fringe housing.

Urbanization also consumes agricultural and other life supporting land. At the present time food production is declining in many world regions on account of declining rangeland productivity, and the fact that further crop yield gains are increasingly difficult to achieve. In some areas aquifer depletion is also a cause. Many developing countries have, in any case, very limited endowments of agricultural land and their cities— which were originally agricultural service centres—are expanding rapidly in the middle of remaining arable land. Egypt is only about 3 percent arable. Other countries with very low rates of agricultural land include India and China. Ramachandran (1989) has pointed out that also the peripheries around expanding development suffer reduced production on account of a sense of impermanence on the part of threatened farmers, pollutant spillovers and the general chaos of mixing uses. In China there have been farmer revolts against extending urbanization because municipalities are acquiring the land of agricultural work units at very low prices for profitable urban development (Economist March 25-31, 2006).

Arguably, then, land development control in urban transport planning has to be considered separately for different venues with special attention to distortive influences. In the developing world these are often magnified by very rapid urban growth.

THE POSITION AGAINST STRONG CONTROL OF DECENTRALIZATION

This position is based on the assertions that dealing with mobility and its side effects is better handled by policies, regulations and services of mobility itself and that attempting to reach these objectives through land use is not desirable, not feasible, or neither.

There is a very substantial US literature on the costs imposed by sprawl on account of additional travel distances, travel imposed costs and fuel consumption, as well as local pollutants and global warming impacts Burchell et al. (Costs of Sprawl 2000, 2002) is an expansive study that produced estimates of total national savings that would be achieved in the US from raising residential densities (Burchell et al 2002, pp. 9-14), but the magnitudes have been criticized for being modest and highly qualified (Bruegmann, 2005, pp. 138-140). Pickrell and Schimick (1999) conclude...
that doubling residential densities would reduce vehicle miles traveled by only about 10 percent. Researchers remind that suburb to suburb commuting, by far the most rapidly rising US trips, have significantly relieved downtown congestion. Others find that, while increased local densities are meant to reduce auto use in favor of walking and cycling, in fact the short distances create more trips, but they are in cars (Boarnet and Crane 2001). Altshuler (1979, p. 391) points out that low densities may disadvantage the population that cannot afford cars (in the US around 5 percent) but that should not impose on the life style of the majority. The problem should be solved some other way.

And again, we are reminded that actions on vehicle engines are much more effective than anything we could do about land use. Gordon and Richardson (2001, p. 143) point out that during the years 1979 to 1996 the US population grew by 29 percent, vehicles by 98 percent, and vehicle miles traveled by 125 percent but at the same time the main vehicle emissions declined.2

So proponents argue that savings of fuel, pollutants and cost through altering urban densities is minimal and making a difference significant to environmental goals would require a revolution in urban densities of magnitude beyond all possibility (Altshuler et al 1979, p. 383). Commentators also observe that while higher densities might reduce aggregate emissions. They would raise the concentrations of emissions in residential areas and forfeit congestion reduction by transferring trips to suburban areas. Evaluation of this position in the developing world entails a number of difficult questions. Of course, in many cities current densities are in the range of 60 to over 200 persons/hectare. In many countries the effort is to relieve high density because of a sense that it threatens health and breeds social pathologies is a force on the opposite side of the question. (It has, after all, not been so long ago that this view was held in the US and Europe, just over 50 years ago when densities there were similar.)

Efforts to control sprawling high-income housing densities have been problematic in many countries. In Santiago Chile lots intended to be reserved for small farms have been converted to large lot housing (documented in Zegras and Gakenheimer 2000). The regulation in India to abandon residential land in excess of 500 square meters (on the books 1976-99) was largely unsuccessful (3i Network 2006 ). Green belts as a means to this objective have been found inoperable (viz. Seoul where development hopped over green belts and urban plans of India, where they have been often included but almost never implemented). The likelihood that densities high enough to achieve important environmental objectives could be achieved during new land development is probably small except in certain countries where the land supply is very tightly controlled by government.

A second point is the assumption that in a widely motorized environment no public transport form will significantly contain sprawl in a highly motorized urban area (e.g. Pickrell 1999). Cervero (1995) found, for example, that the San Francisco BART system caused significant but quite small effect on settlement in the Bay Area after 20 years of operation. In application to the developing countries, the value of this conclusion depends on the current and expected levels of motorization. The actual future of auto-based decentralization varies by levels of future motorization (by four-wheeled and also two-wheeled vehicles), but it is sure to be the case that there is a part of the population that will become motorized, and that they will pioneer a land use pattern that will guide development to low densities for years to come unless draconian efforts to control land use are applied. It is important to acknowledge that for environments where auto ownership is likely to remain low for many years to come transit access and residential densities to support transit access will be very important.

The fact that mass transit (metros) does not generally reduce congestion is an accompanying argument. This point is reasonably proven. The number of transit passengers who come from other modes are principally former bus passengers and any former car users leave spaces in the traffic quickly eaten up by former repressed trips (Halcrow-Fox 1990). The other optic on this phenomenon, that mass transit increases the passenger capacity of radial corridors and probably bolsters the economic survival of downtowns, is seldom mentioned. It is, in effect, a kind of land use strategy, and as such may be very important.

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2 A good set of readings on this position is Robert Bruegmann, Sprawl: A Compact History (2005), Gordon and Richardson “The Sprawl Debate: Let Markets Plan,” Publius: The Journal of Federalism, (Summer 2001) and Boarnet and Crane Travel by Design (2001). In spite of being by now dated, the arguments are handled very well in Alan Altshuler The Urban Transportation System (1979)
There is a tendency for decentralization to come to a sort of equilibrium over time. At first residences decentralize faster than trip destinations, causing great congestion in the radial roadways. Later on the destinations also decentralize so that the congestion decreases to some extent as the growth of travel becomes increasingly suburb to suburb. Ingram (1998) points out that Bogotá retained roughly the same travel distances (not travel times!) across a period during which the metropolitan area population grew by 40 percent.

In the case of the United States observers point out that agricultural land is disappearing very little on account of the encroachment of urbanization, but primarily because more is being grown on less land. Agricultural land is being lost, in fact, primarily to reforestation, not to urbanization. This is not applicable, for example, to China or Egypt where only a very small portion of the national area is arable and the rapidly expanding cities and towns are located mostly close to rich agricultural areas.

In sum, the position to control environmental conditions principally through technological advances and the regulation of transport use, while abandoning efforts to strongly mitigate environmental problems through land use solutions, has some telling arguments when dealing with high income countries. But the balance of arguments between these positions changes when dealing with many of the cities of the developing world.

What is the difference? It is impossible to generalize about cities in the developing world, but it is possible to suggest that compact land use as an aspect of transport planning is relatively more important than in the north in cities where:

1. Vehicle ownership is growing rapidly
2. Urban population is growing rapidly
3. There is spatial fragmentation of social groups because of access differences between those who own cars and those who do not.
4. There is a problem of hoarding land in the vicinity of cities in anticipation of higher prices or rents.
5. There is a problem of scarcity of urban land (e.g. because of natural obstacles to urban growth of coasts or topography, or because large areas are in the hands of ownerships that cannot divest the land, such as government agencies or religious organizations)
6. There are policies of decentralization because of current overcrowding but no means of controlling the decentralization
7. Urban governments count strongly on revenue from the urbanization process.
8. There is the possibility of proactive management of urban land by local government (as distinct from cases where this is largely forbidden as invasion of the sphere of the private sector.)
9. There is a need for additional serviced land for low priced housing.
10. There is an acute scarcity of agricultural land.
11. Where the vehicle fleet is old and effluents are hard to control through inspections and maintenance requirements

WHAT KIND OF GUIDANCE?

There have been few indications of effort to merge these points of view into an approach that shows even a limited symbiosis of mutual support. The World Bank produced a number of strategy studies in urban transportation since the 1970s in which the land use side of the transportation planning typically got a nominal single page of attention (viz. World Bank 1996, pp. 59-60). But Cities on the Move (World Bank 2002), authored by Ken Gwilliam, at last took a brief but focused cut at this problem.

Beginning with a basic assumption that cities in the developing world need to relieve crowding to some extent, Cities on the Move points out that there are virtually no grounds for establishing how fast or how far to push decenentration. Further, the effectiveness of policies intended to facilitate this process have generally been difficult to appraise, have often shown little effect, and in other cases been difficult to control. Under these circumstances it makes sense to permit markets for land development to help rationalize the pattern of growth.
As between regulation or land use versus a market approach in which beneficiaries pay the costs, the report says:

“Neither approach is sufficient in itself. Full internalization of externalities, precluding the need for any planning intervention, has not been achieved even in the most sophisticated of market economies, such as the United States. Moreover, the longevity of major infrastructure is such that conventional financial decision making discounts the effects over much of its life. On the other hand, planning undoubtedly works better if supported by, rather than working against, economic incentives. Thus it is advisable to look at the effectiveness of both administrative and market-based instruments in the search for a strategy on land use and transport.” (World Bank 2002, p. 16)

This approach requires willingness and foresight to plan on the part of the participating governments with both the land use and transport components in play, calling upon a wide range of sectoral policies. It requires a set of technical skills to develop a plan that carefully considers anticipated relationships among its parts. This means also reviewing all the projects, partial plans and regulations bearing on the objectives of the plan so that land use, public transport and development controls are linked in a coherent manner that consistently supports the planning objectives. This is not at all easy to do. Relevant policies and actions are in the hands of many different agents with different objectives, such that aligning them in the same direction is likely to be fraught with all kinds of impediments. Analysts are pointing out that in the case of US cities efforts to constrain sprawl are hampered by zoning ordinances that inadvertently propel sprawl in their effort to assure benefits of different kinds (Levine 2005).

One perspective, then, is to orient transport facilities to generate an efficient settlement pattern while overcoming obstacles encountered by land development as it attempts to follow. This might require: clarification of property rights, speedy adjudication of land invasions, assuring titles in fee simple (without obstructions to sale), incorporating infrastructure at full cost, revision of zoning restrictions, eliminating the obstacles to recycling of public land and other land holdings, also broadening and deepening the financial markets’ support of housing. For many economies this is a tall order.

The next question is given that positive adjustment between public transit and the form of cities can be induced at length; how long an effort does it take to create this effect under circumstances of changeable policy and political regimens. Most cities across the world show indications of the transport technologies in use during specific phases of urban growth—very narrow streets and high densities until the mid 19th century, then tramway corridors and somewhat higher densities through the 1940s, followed by auto energized densities since then.

Cervero’s The Transit Metropolis (1998) provides a number of case cities where these adaptations have taken place. Many of them have taken place over a length of time, showing ample effects of the transport technologies that were prevalent during different phases of their growth. Others, such as Curitiba, Toronto and Mexico, however, have taken on adaptive forms in relatively short periods. Cervero’s leading prototype model, called the adaptive city, is the most widely used land-planning prototype. This prototype is characterized by a metropolitan center with radials extending out from it. Along the radial corridors urban subcenters are ranged, generally declining in size from center to periphery. Most urban plans worldwide are some variant of this prototype, sometimes with only weak radials to guide the series of subcenters, sometimes with circumferentials between subcenters, sometimes not. It is demonstrably a tendency in the growth of many metropolitan areas and consequently the best candidate for the adaptations that mould land development and transport proaction with the forces of the land market. That is, it is a strategy that follows the advice of relating these two orientations by the World Bank, quoted just above. It imposes structure that probably shortens trips while at the same time exhibiting the often mentioned principle that urban planning is “a collaboration with the inevitable.” Historically, the most impressive cases of this dynamic have taken place where driven by massive metro investments (e.g. Toronto and Mexico), but more recently bus rapid transit may have the capability of creating similar guidance (though Curitiba’s remarkable land development controls keep it from being an encouraging example). Bus rapid transit is the mode to watch toward possibilities of creating strong guidance of urban development. Persuasive examples have been slow arising because of a tendency for planners to avoid stretching them outside of existing urbanized parts of cities. (Tramways in the late 19th century had powerful land development impact because
entrepreneurs specifically extended them with a view toward generating higher land values and development, most dramatically in Los Angeles. (Fredericks 1992)

So what are the prospects for influence in this land use and transport mode relationship? One obvious issue is the speed of growth of the metropolitan area. Indeed, one issue underlying the pessimistic view on the guidance of growth of the US city is the fact that, while the effort was ambitious at an earlier time when these metropolitan areas were growing rapidly, at the present time most of them are growing only slowly. In the developing world, however, the scene is different. There are many urban populations (in China, for example) that are growing at rates up to 3 percent a year. That means a metropolitan population the size of the existing one will be added within 25 years, and the physical spread of the metropolitan area will increase by about 3 times (Angel 1995). Within a reasonable time, then, there is ample possibility to have a telling effect.

But how about continuity of growth and transport management under possible impact from frequent political change? Large-scale public transport investments in cities across the world have shown remarkable continuity, even in the face of political change because a project start tends to commit subsequent administrations to continue it. As a dramatic case, during the final years of Chile’s Christian Democratic administration in the late 60s, public works director Juan Parrochia began implementation of the Santiago subway system by, for example, excavating a great trench for a station in the city’s main avenue, immediately behind the Presidential Palace. For the following years Chile experienced extreme changes of governmental ideology, but there was virtually no delay in advancing the subway project, though it entailed a substantial part of the national public works budget for some five years. There are very few cases worldwide of abandonment of such projects. Even so, today’s movement toward bus rapid transit no doubt owes its widespread reception in part to the fact that significant projects can be completed within a single governmental term (accomplished by Mayor Peñalosa in Bogotá). At the same time these improvements often take place with little attention to urban structural effect. Choice of corridor is typically conservative. Participatory planning processes generally have little tolerance for transit investments to guide development where there is no current demand while existing corridors are badly underserved. This explains why there has been very little use of bus rapid transit so far outside the context of existing urban development in the cities where it has been undertaken (with the dramatic exception of Curitiba).

The issue of continuity is more difficult to interpret on the land development side, partly because of the uncertainty in general of plan implementation and inadequate enforcement of regulations. However, land development plans are not typically altered in the course of government change. In addition, there are short-term actions that can condition development, such as persuading a group of corporate locators to create a development cluster. In a plan for Bangkok we proposed a rotating fund that would be used to simply install infrastructure at the locations of planned clusters, waiting for the arrival of developers who would be obligated to pay their share of the infrastructure cost. To achieve transport-compatible land development governments must take proactive part, rather than depending on regulation. The extent to which governments can engage in land development depends on national rules and custom. Many governments consider this to be an invasion of private market prerogatives.

Another major issue in planning urban development/transport coordination is the level of existing or shortly expected levels of vehicle ownership. As noted, a prominent argument in the US debate has been that public transit has little prospect of success in leading urban development in competition with the convenience of private cars in a substantially motorized city. There is little doubt that land use guidance is much more difficult in highly motorized environments. In the developing world there is an interesting task, then, to consider for rapidly motorizing cities how long the window may be open until the thrust of spinal public transit begins to lose its strength. This matter is hard to evaluate. Even in regions where motorization is currently increasing by leaps and bounds motorization may have important constraints. For example, in China autos are increasing at as much as 30 percent a year, but with the increasing separation of income levels resulting from liberation of the markets there is likely to be a very substantial part of urban populations that will not be motorized for many years to come. Indeed, the mobility of lower income people is being further jeopardized by the declining viability of motorized two wheelers and bicycles, by regulations against their use or by simply getting crowded off the streets by four wheeled vehicles. This may produce a population with two parts—motorized and non-motorized—presenting an interesting situation for land use planning.
One question here is what one means by motorization. Delhi shows an annual income of less than $2,000 per year but 80 percent of families have motor vehicles, mostly two wheelers (World Bank 2002, p. 6). Indeed, it is much more motorized than cities with several times that income level where two wheelers are not a significant part of the vehicle fleet.

All these issues are interestingly combined in Cervero’s (1998, pp. 370-400) very useful review of the situation in Mexico City metropolitan area. Mexico has a very large metro network, beginning operations in 1969 and including 11 lines for nearly 200 kilometers. It is very heavily used (though not self financing) and probably responsible for the healthy survival of the city center, since there is no other way over a million employees could be working there. Recently (2005) a very successful new bus rapid transit line has opened on Avenida Insurgentes. Transit is complemented by a day-a-week driving ban established on account of the intense congestion and air quality problems of the city. At the same time there has been relatively little clustering of development along the metro lines, except in a few cases where groups of large-scale locators have created development nodes. One possible explanation is that this subway system has been created virtually in isolation of any planning of the land use system or enactment of encouragements or regulations designed to stimulate development in the adaptive city form. Secondly, the metropolitan area has a particularly chaotic surface public transit system, resulting partly from problematic governing problems among the different jurisdictions of the area and failed management of the public bus transit system. The result is that the metropolitan area has a very informalized transit system. It also has a relatively high personal motorization level. The underlying transit system is what Cervero calls “adaptive transit,” that is transit that has evolved to offer a service that is as close to door-to-door service as possible by using relatively low capacity vehicles. The experience offers, then, the apparent lesson that mobility in adaptive cities cannot be assured by even the most powerful heavy transit service when other parts of the requirement are not fulfilled.

A FRAMEWORK FOR URBAN TRANSPORTATION AND LAND USE PLANNING

(Figure 1 about here.)

Figure 1 is intended to be a prototype framework for urban transportation planning. It can be considered a flow diagram to follow in the course of preparing a comprehensive urban transportation plan, or simply an expression of the connectedness of the parts of any partial planning effort. Each element of this diagram will each be subject to discussion in the text below.

National Urban Transport Policy

The need for a national role in metropolitan urban transport planning is obvious but seldom significantly filled. The need for the nation to support local efforts to get capital loans, to provide professional training, determine technical standards, organize public transport and other services are the basis for the critical importance of national urban transport policy. Capital cities may not need it because they get national assistance on an ad hoc basis, but secondary cities are likely to feel—and be—lost without it.

The current concern for globalism and the internationalization of business and industry generally, puts an additional importance on national policy for this sector. It is clear that adequate urban transport is an important aspect of urban competitiveness. According to some hypotheses globalism tends to strengthen stronger cities and weaken the less competitive ones (Léautier, 2006). The implication is that secondary cities are likely to fall further behind during globalization. Inexpensive bus rapid transit is bringing high performance transit closer to possibility for secondary cities, but they are therefore so much the more sensitive to the need for technical and financial support from central government.

This problem was dramatized in a recent conference in Latin America where urban transport delegates and staffs from four countries were present. Under the session rubric of National Urban Transport Policy, two of the national delegates started their remarks by simply saying there was no national urban transport policy at all in their countries. A third said there used to be one but it was lost in a change of government. In a situation where capital cities were breaking into new technologies for improved public transport, it was the secondary cities especially that were lamenting the absence of national support for securing capital loans, for dealing with the unruly operators of existing concessioned transit systems, for assuring continuity of policy and projects.
during turbulent local politics, and for assisting with advanced technical services that the secondary cities lack. “We are flying blind”, they said. In the absence of such leadership from the national level the group decided to attempt an international consortium of cities that could share problem understandings and report the results of efforts to solve problems. There are, in fact, quite few countries in the developing world that have anything resembling a national policy. Particularly with regard to public transport administration, the topic is so politically turbulent that there is a tendency for government agencies to keep their distance from it if they can.

Under these circumstances it is particularly interesting to observe the fresh start being taken by the Indian Ministry of Urban Development to create a rather comprehensive national urban transport policy, approved by the government (Government of India, March 2006). Specifically on the topic of transport and urban land, this policy sets out as one of its objectives:

“Encouraging integrated land use and transport planning in all cities so that travel distances are minimized and access to livelihoods, education, and other social needs, especially for the marginal segments of the urban population, are improved.” (Government of India, 2006)

It pledges 50 percent of the cost of preparing land use and transport plans provided the cities demonstrate their willingness to act in accordance with them. The Ministry envisions pilot studies in a few sample cities in which local authorities would be encouraged to identify potential corridors for future development and establish transport systems that would encourage that growth.

The policy statement goes on to mention other principal commitments, including the use of initial sketch plans to evoke visions of future development, the equitable allocating of road space by mode and population groups, and the adoption of economical high capacity transit systems with guidance on technological choice. The policy also addresses the need for general priority to public transport, to non-motorized transport, to freight traffic management, the use of cleaner transport technologies generally, and the management of allocation of land for parking in a manner that recovers the economic cost of the land it entails.

There is considerable attention to the issue of financing capital projects in public transport up to 20 percent of capital cost, after attention to a variety of factors that assure the quality of the investment and the completion of complementary measures. The policy includes a commitment to help develop innovating financing mechanisms based on land, and creative ways of involving the private sector.

The institutional part of the policy requires the creation of Unified Metropolitan Transport Authorities. This is an important aspect of the policy because it is the beginning of possibilities to integrate the sector and to give it some executive strength. It also addresses the need for improved training in urban transportation and the preparation of improved sources of data. Efforts are under way to create these bodies. One exists in the city of Indore, Madhya Pradesh.

Perhaps the most complete structure for national urban transport planning and management has been that of Brazil. It is a case that bears special attention for anyone considering the creating or improvement of policy in this sector (Vasconcellos 2002 and 2005). Brazil developed its national urban transport policy over an extended time, beginning in the 1970s with instructions concerning the preparation of metropolitan transportation plans, and the beginning of the preparation of those plans. Though adjustments have subsequently been made that leave these functions less integrated than earlier, Brazil had a model national urban transport policy system for some 20 to 25 years. The first federal agency was GEIPOT (Executive Group for the Implementation of Transport Policy), responsible for the development of national transport master plans and a national database. GEIPOT also coordinated the use of dedicated taxes for the financing of urban and regional transport systems. Later the EBTU (Brazilian Enterprise for Urban Transport) was another federal agency, created to prepare transport master plans for large cities. These exceptional public agencies were responsible for the creation of important plans and for generating a national-state-local system of attention to urban transport.

These have been complemented by the creation of a non-governmental association of public transit systems, the ANTP (non-governmental National Association of Public Transport) which has dealt with the bases for setting transit tariffs, the design of the PADRON bus which became the basic vehicle of urban transit, the promotion of bus corridors in
cities, the vale-transporte program to assure transit service for low income employees and a number of programs of training in urban transport. ANTP has also helped organize a National Forum of State Secretaries of Transportation which has regular meetings to discuss common problems.

National attention to the urban transport sector has shifted over time between the Ministry of Transport and the Ministry of Urban Development and Housing, as it has also in the United States. The roles of national attention to the sector have been very comprehensive. They have dealt over time with:

--The price of gasoline, alcohol fuel, and diesel fuel.
--Finance of the production of vehicles, including transit vehicles, by Brazilian industry
--Finance of the acquisition of transit vehicles through loans
--Salary corrections that have impacted the cost of transit operations
--Use of the vale-transporte (by which low income workers receive transit tickets in exchange for a pay reduction of smaller value) a program used by around 50 percent of trips in the large cities.
--Participation in national transit legislation dealing with issues such as transit operator insurance and the regulation of emissions.
--Technological policy, such as the development of the PADRON bus and other issues through the Ministry of Science and Technology.
--Urban development oriented policies such as the relocation of households displaced by transport projects, and establishing priorities of service to low income travelers (responsibility of the Secretariat of Urban Development of the Presidency of the Nation.)
--Through the ANTP formation of a National Forum of State Secretaries of Urban Transport.

Simply the news that there are secretaries of urban transport on the governing cabinets of states of the nation is, in itself, a remarkable institutional achievement of the field. The states are responsible for system coordination and sector regulation in their metropolitan areas. In practice the municipalities are specifically responsible for the organization of public transport.

In sum, the possibilities for national policy to measurably improve the performance of urban transportation in cities are numerous and extremely important. The lack of effective policy at this level in most countries should be a subject of major concern. Since the metropolitan and municipal level are where the problems reside they are the best advocates to press national governments on the creation of adequate national policy institutions.

Problem Prompted Choices for Inventories and Surveys

Lack of suitable data is a serious limitation in many urban transport studies for developing cities. It is important to be judicious in choosing the content because useful data is critical for some purposes, but surveys are expensive and time consuming. Further, it is unwise to collect unnecessary data because updating it will be an unwelcome burden. An important matter to keep in mind is that in an environment of rapid and unpredictable change the detailed accuracy of survey and forecast is likely to be less important than the capability of this data to sustain examinations of the relative merits of policy and project alternatives, in some ways a less demanding exercise than predicting the future.

The basic categories are economic and demographic information, land use or activity location data, vehicle fleet surveys and the travel demand survey. These items are fairly conventionalized, but need variation for particular developing cities and particular policy and project intents requires special attention.

One element that merits special attention here is the vehicle fleet surveys. Registration records are likely to be poor, including vehicles registered long ago and already out of service (a problem in India), falsified registrations, or unrecorded registrations (e.g. by the armed forces). For purposes of environmental policies it is important to know the number of vehicles by vehicle type, the form of power technology and age.

Two-wheeled motor vehicles are particularly important to monitor. They are particularly numerous in some countries and virtually absent in others. (Mumbai has little more than ten percent of the GNP/capita of Mexico City, but Mumbai is almost as motorized as Mexico City if one counts the two wheeled vehicles, of which Mexico has very few.) Most two-wheelers are powered by two-stroke engines, which pollute heavily, but provide extraordinary mobility to people.
who could otherwise not afford it. This is an important quandary. Bicycles and pedestrian transport also merit special attention.

Freight related transport is also of special importance. Most developing cities suffer a poorly organized trucking industry with low quality trucks forced to operate inefficiently because of traffic, management and delivery restrictions. Lack of loading and storage facilities and other considerations. Yet trucking is, of course, an important element of industrial development.

As part of the infrastructure survey, it is important to include parking facilities—on-street, lots, and parking structures, as well as employer and resident owned parking. This is because control of the parking supply is a part of validating urban activities on the one hand, but controlling traffic congestion through restraints or alleviating it through supply in other circumstances on the other. Developing city centers tend to reach thresholds at which commercial parking structures are built in large numbers when the financial return for parking exceeds other land uses. In Santiago de Chile this tipping effect took place in about 1970. In Cairo it was about 1980. These changes need to be tracked and policies relevant to them enacted.

The origin-destination survey is traditionally the most expensive part of a transport study. The questions of sample size and sample content must be carefully considered, again with attention to the needs of the city in question. It is a particularly useful tool in considering the relative merits of alternative projects and policies, rather more than the question of estimating total future demand—which in any case is not likely to be fully served by possible facility enlargements and extensions. Disaggregation of demand by mode is important. Most widespread software for this purpose does not do

Budget and Finance Possibilities

Planning needs to be undertaken with a sense of budgetary realism. The most frequent problem is that the plan produces a very ambitious list of projects that are beyond reasonable expectation in the foreseeable future—such as a metro at $100 million per kilometre with no possibility of clearing even a major portion of its operating costs. It is important not to engender false hopes that might supersede the possibility of accomplishing more modest improvements.

Though this sounds reasonable, it is very difficult fully to settle. As every government officer knows, feasible budgets for projects are partly a result of the quality of the projects and the extent to which they attract the attention of decision makers. And there is always the possibility of attracting a foreign loan or private entrepreneur. Partly as a consequence of globalization, transport agencies all over the world are looking for willing sources of private investment. Unfortunately, they are least likely to be attracted to relatively low-income environments with possibly risky future economic conditions.

The search for funding also has local form. At a recent meeting of Latin American national and local officials on urban transportation there was examination of all kinds of possibilities (Banco Interamericano de Desarrollo 2006), including benefit assessments, payroll taxes (like the French versement transport), improved cadastral records providing higher land tax yield, vale transporte (providing transit tickets to low income workers in lieu of a part of their salary of less value). The discussion had an air of speculation that lacked a sense of expected possibilities. Finance of urban transportation projects has probably become more searching in Latin America now that bus rapid transit has been successful and brings costs (perhaps at $5 million per kilometer) into somewhat more realistic view. There is a serious need for capital support for mass transit projects, especially in secondary cities. This is perhaps the liveliest topic in urban transportation at the present time and a good one for cities to study cooperatively.

Prior Land Development Plans (or Preparation of Land Development Plan)

The best option would be to develop the transport plan and the land development plan concurrently with the same staff, or a closely communicating pair of staffs. Unfortunately, while collaboration between these subsectors is at the core of this exposition, there are bewildering differences between land use and transportation planning that lead to problems. The issues are:

1. The most basic objective of transport planning is human mobility, which at least at the introductory level is simple. The objectives of land use planning are numerous. They include housing accommodation, social equity,
economic development, production of variety in habitat, isolation of incompatible uses, and so forth. Some of these are also ultimately objectives of transport as well, but tend to be structured by the initial concern for mobility. The two activities are bound together by a concern for environment, especially air quality, but dealing with it in the context of their otherwise diverse concerns is difficult. As a result, in initial principle land use planning is more complex than mobility planning.

2. The techniques of planning are different. Transport tends traditionally to be based most fundamentally on the analysis of travel demand, entailing standardized analytic tools as the spine of analysis. Land use planning is, of necessity, more eclectic in form, utilizing open design approaches. It is important to note that this distinction is declining in recent years as transport planners are extending themselves to deal with a number of different considerations that are not centered on the issue of demand, but instead use demand tools for partial evaluation of strategies.

3. The scales of concern are different. Transport planning deals with an integrated system of movement corridors that must remain in some sort of equilibrium across the entire metropolitan area. Land use planning, for the most part, is essentially more local, the responsibility of smaller units of government. Accordingly the levels of government responsible for implementation are different.

4. The units of implementation are at different scales. Transport infrastructure is implemented in large indivisible units based on project approvals while land use plans are implemented parcel by land parcel, not until the development of the parcel is addressed by a proponent, and often subject to resolution of project content on that level.

5. Transport decisions are more reliable to be implemented, since they are actions of government. In contrast, private actors make most land use decisions. While some of them are subject to regulation and negotiation, they are likely to distort the original plan intent.

6. Transport involves large capital budgets, land use planning does not. This in itself puts the responsible government agencies in different categories of administrative strength, since the leverage of public agencies tends to reflect the size of their budgetary throughput.

7. Transport requires a long-term vision of the future guided by durable infrastructure. Land use plans are enacted parcel by parcel. They can be changed on short notice, and each request for deviation seems a trivial exception.

8. All this results in different kinds of judgment about the future. Transport planners are explainably more conservative regarding assumptions about the future. Land use planners are likely to be more ambitious about the pursuit of goals against the force of development trends.

While it is useful to point out all these separate influences in land use and transportation planning, it should not forestall efforts at collaboration. On the contrary land use planners should notice that putting land use and transport together facilitates much firmer prospects for real implementation of land use plans than before.

Nonetheless, when a transport planning process inherits a land use plan it is necessary to come to terms with some of the issues above, working them out with a land use team engaged directly in the transport plan. Some of the issues are:

a. Does the amount of urban development in different categories seem realistic, given trends? What is the proportional balance of prospective uses of land?

b. What has been the record of implementation or evolution of development consistent with the plan? Has the amount of industrial development anticipated actually arrived? Has the growth of informal settlement been realistically projected? Is it possible to do so?

c. What roles have local governments played in land use plan implementation? Have they been successfully regulatory? Are they capable of assertive action in land development?
d. Does local developer behavior promise possible collaboration with mobility improvements and land use planning in a group initiative?

e. Are there possibilities of financial support for planned development through taxes or charges, such as benefit assessment?

f. Are there possibilities for new development attraction to transit corridors likely to provide early reasonable volumes for the transit?

The details would change in accordance with the cases. The effort is simply to merge the two plans for mutually supportive undertakings that are progressive and realistic in the minds of both sides. This is a key point in the preparation of the plan. It needs to be undertaken carefully with attention to the objectives of all participating agencies. It needs to be considered by public participation and with the participation of stakeholders who may make investments based on agreements with both the land use and transport sides of development.

Review Viability of Current Projects and Policies

The need to review prior project commitments is evident, but it benefits from being formalized as a step in planning. Otherwise it is typical for confusion to occur as various actors make different assumptions about the status of existing project proposals. It is important to conclude whether these projects should be considered prior commitments of the new plan or are available for adjustment or supercession.

At the same time, it is clear that such current projects may be subject to disagreement among planning actors and stakeholders, or their future may be less predictable than originally believed, now under circumstances of restudy. Mayor Enrique Peñalosa of Bogotá undertook bus rapid transit, replacing a commitment to metro that was at an advanced stage of planning and had been part of the election platform of the sitting President of Colombia.

Projects considered current may in fact, realistically speaking, be too expensive for implementation. Others may be projects proposed in isolation with incomplete support, but could be brought into more probable circumstances in context with a plan that supports their significance and feasibility. For example, the proposal of new local tax collections may be much more viable in the context of specific projects the additional revenue would finance.

Design of Strategic Objectives

Professionals often assume that the standard analyses of system survey and demand forecast will throw up the requirements that need to be met by new infrastructure and policy. In fact, the process has many basic choices to make.

This outline is not suggesting specific levels of plan development at which decisions take place. Rather it assumes that committees of technical professionals and stakeholders will accompany all the decisions under consideration. Nowhere is participation more important than in determining the plan objectives.

At the same time it is important to point out that vantage on the objectives will be subject to change as the study goes on. As a result, review of these objectives and the constraints applied to them needs to be recurrent. Ultimately, it is impossible to understand the full set of views on the construction of a new road until plans specify the properties that will need to be acquired for the right of way. Every phase of increasing definition of a plan feature brings forth new perspectives on it. The final phase of determining what land uses need to be removed for a transport corridor is sure to unleash some concerns for the first time.

But again a sense of orientation at the beginning is important. For example, if economic development is important to the study, considered a feasible objective of transport and land planning, and if the reinforcement of city center economy is an important part of it, then the preparation of intelligence on the city center is important.

Here is a list of possible plan objectives:
1. To advance urban economic productivity by emphasizing trip making that is most critical to the economy. That means special focus on commodities movements, trucking facilities. Some US states are now proposing truck-only highway lanes. The portion of trucks in developing cities is a larger portion of the traffic than in northern cities.

2. To maximize trip-making opportunities by whatever modes are the most efficient in doing so (that is, to provide the most trip making possible for a given, limited public investment, or provide a targeted amount of trip making for a minimum summed public and private cost.)

3. To expand urban transport facilities as quickly as possible subject to the constraints of the preservation of valued land uses (such as historical sites), relocation problems and financial limitations.

4. To reduce environmental consequences of transportation effluents through traffic management measures (such as driving bans, parking restrictions, congestion pricing, etc.)

5. To improve land use impacts of transportation through the judicious placement of new transport infrastructure. Critically, one aspect of this decision is whether to take a proactive public role or affect impacts only through regulation of land uses.

6. To facilitate the increase of housing stock for the urban poor through increasing the amount of serviced residential land. Servicing of land includes mobility services.

7. To assure that all new development be accessible to effective public transit service.

8. To assert the requirement of micro planning of land use with mixes of uses that induce short urban trip lengths

9. To privatize transportation facilities and services to every extent possible.

10. To commercialize transportation facilities and services as closely to full cost as possible.

11. To restructure the roles of different urban modes—auto, truck, motorcycle, bicycle, bus—to maximize their joint efficiency and potential

12. To control urban street congestion to a specific level through some combination of vehicle registration control, traffic management and facility expansion. The targets would be specific minimum speeds for the different transportation modes and facility types.

There are many possible alternative objectives, and levels of priority among them. It is important to compose objectives for purposes of guiding planning activity so that the following phases will address them, will examine and recompose them in the light of revealed opportunities and obstacles, and will produce a coherent plan. Again, we envision that overall consistency cannot be achieved. The plan will include features that highlight one objective while jeopardizing another. That is probably inevitable, but planners should be conscious of it.

Another perspective on the objectives of transport planning is that of improving air quality. This is possible, of course, in combination with mobility objectives, but brings also traffic restraint actions into prominent play. In this orientation immediacy of effect and political feasibility are important variables. Political feasibility is a question of local “knowledge culture,” and therefore difficult to discuss as a general matter. However, it is worth considering immediacy of significant effect. As a first cut we could divide actions into four groups:

Directly effective actions: These include actions to reduce vehicle use (e.g. through pedestrianization, parking policy, driving bans and congestion charges), requirements to change fuel (e.g. putting transit on CNG) and improved engine fuel efficiencies. They may be difficult to enact, but cities are increasingly resorting to them.
Conditionally effective actions: These are workable depending on user response patterns. They include clustering origins and destinations, improved street pattern designs, and large scale public transport investments. These actions could make more efficient use of vehicle-kms but the actual result depends on the form of user adaptation.

Eventually effective actions: Land use policies are in this category. As density may accumulate due to forceful policy, increasing population shows adjustment to shorter trips and appropriate transport modes, but probably with significant effect only at the level of a few decades.

Potentially effective actions: These are actions likely to stir the most discussion. They have directionally correct consequences—producing relevant effects—but very small results unless there should be a change of heart of the users or a new strong assertion of public policy. Meanwhile they create an environment of commitment, and that is useful, but should not be mistaken for problem solving in the near future. The best example is bicycle ways. There are exceptions, but for the time being in most cities the small use they stimulate is sure to be mostly facility-generated trips, and in most cases by people not leaving cars at home.

All these actions have roles in air quality enhancement, but planners should understand the significance of the ones they are choosing. Many different policies show proper commitment and directionally correct consequences, but real effectiveness is a matter of how much impact can be bought by specific project budgets and by what time horizon.

Transport Plan Components

Infrastructure Development Plan: This component is the forecast of future travel demand by modes and individual links in the transportation network as a basis for planning roads and public transport infrastructure. It requires an origin-destination survey that records trip making by individuals, including the details of trips made during the survey day and personal information that facilitates the projection of trip making into the future. Trip making is then forecast for links of the modal networks for future dates.

Many portrayals of the urban transport planning process would present this travel demand component as the central element of the effort. It is indeed the most expensive and time-consuming part of the planning activity when the planning process includes it, likely to require over half the study budget. In this writing, however, it is portrayed as only one of four streams of activity, since the other three components only partly on travel demand analysis. This is because the other three components depend in good part on actions taken in the short run, and which can be adjusted to enlarged need in due course, without very large expenditures required long in advance. A further limitation on the usefulness of long-range estimates is that they depend on the adequate future projection of personal incomes, vehicle ownership, urban population size, traffic management actions and the locations of future land development, likely to be themselves difficult to project with any confidence to future years in many developing cities.

In any case it is wise to prepare these forecasts for the context they provide to planning. Attention is important to choosing models that have the flexibility of examining different expectable urban futures and different policy assumptions. Comparisons among different futures that examine various hypotheses on a ceteris paribus basis are more important that attempting to achieve maximum accuracy of future estimates. Comparative futures may be more useful if they are based on the same growth assumptions, since then the differences between policies proposed may be more accurate.

Traffic Management and Demand Management Planning: This deals with the modification of vehicle use through restraint measures, road use pricing, parking policy, special lane designations or other means that generally entail only limited new infrastructure. The transport planning process often excludes traffic management because of a sense that it does not require the forecast estimates or the high infrastructure investment that are involved in other parts of problem solving and therefore can be done on an ad hoc basis.

Here we argue that these actions should be considered in context with other aspects of transport planning. The purpose is to acknowledge that (1) traffic management may be considerably more powerful in solving critical mobility and
Traffic management options have the disadvantage of being typically new and novel wherever they are proposed. As a result it is hard to garner political and public support for their enactment. Transport professionals in the public sector and political leadership are characteristically hesitant to propose these measures because failed performance is likely to have quite unfortunate political consequences. Indeed even successful performance is likely to be open to damaging criticism by inconvenienced users. The possibilities of this consequence are exaggerated by the fact that details of implementation are likely to be pivotal in the reputation of the action (such as he hours of driving bans, or whether taxis are included in driving bans or not). The result is that surveys of transport professionals are likely to reveal considerable interest in the possibilities of these measures, but when confronted with choices they are likely to vote for simply devoting more investment to conventional public transport even when the mobility improvement would be plainly very modest.

Gradually, however, the adoption of demand management measures has been increasing worldwide. Cities are learning that these are the only actions effective under increasing incomes, increasing motorization, increasing populations, and increasing personal trip rates (personal trips per day) which are raising traffic volumes by 10 percent per year and more in cities throughout the world. Pedestrianization has been undertaken in literally hundreds of French cities with assistance of the national Ministry of Transport, and in major cities such as Bogotá and Seoul. Efforts to encourage the use of bicycles are being undertaken by numerous (non Asian) cities, including most of the nearly fifty Latin American cities with applications recently pending decision for Global Environmental Facility support. Driving bans have been stably retained in a number of cities with difficult air quality problems—such as Mexico City, Santiago de Chile, Bogotá, and Sao Paulo. Congestion pricing almost completely cured congestion in downtown Singapore, has been effective during several years in Hong Kong, and has withstood the test of a Mayor's re-election in London. A number of cities are preparing to introduce congestion pricing, including Stockholm and Gotteberg. However more comfortable it may be to simply extend current enhancements of urban transportation; cities are seeing that demand management is the only way to effectively confront the current level of growth in the pressures of travel demand.

Nevertheless, since the actions proposed are likely to be novel to the city the important thing is development of understanding through dialog. Especially as regards he possibilities for congestion pricing, people need to become aware of the somewhat complicated changes these actions are likely to cause and understand them. People's first reaction is likely to be against any effect that causes them to change travel behavior, and especially to restrain travel behavior. They are also likely to initially oppose a new charge for using their cars. The author had the occasion to open dialog on the possibilities of congestion pricing in a seminar group of mostly public professionals from four major Latin American cities. He did so with considerable hesitation, supposing that the response would be negative. (There is no congestion pricing at this writing so far in Latin America.) To his surprise, these responsible professionals showed considerable interest in congestion pricing—though not necessarily a predisposition to embrace it. Interestingly, their first concern, on which they spent some 45 minutes of discussion—was: What should we name it? Should we say, “congestion pricing,” “value pricing,” “rationing”…or what? The issue was to give it a name that would sustain discussion and not prompt people to slam the door against discussion of the idea before they even could fully define it. The start has to be slow and careful.

The issues in traffic management include the initial appearance that it is an obstacle to habitual travel patterns. The important response is to clarify that e.g. congestion pricing also opens mobility. It speeds up arrival for those who pay the price because the traffic is reduced. It speeds up transit because transit is more affected generally by congestion than other traffic—and because transit capacity is added complementarily to the congestion pricing. It can and will be fine-tuned to overcome congestion, so it will not be simply overcome by growth of vehicle ownership like previous solutions. A second issue is: It’s another charge for public service. People are used to finding that such charges provide no services to them but simply disappear into unknown coffers. So it is important to specify what programs or

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3 This resulted from a survey of responsible transportation professionals in the Mexico City region. See Anjali Mahendra and Ralph Gakenheimer “Vehicle Restrictions for Congestion Pricing in four Latin American Cities: Is a Transition Possible?” ms. MIT 1996
Institutions are to be benefited by the revenue. Some observers will be concerned that congestion pricing would disadvantage lower income auto owners who in any case need to pay the congestion price. Others will be concerned about the problems of policing and equipment damage, as well as vehicle detection and forms of evasion. There are sure to be many concerns to work out before the program can move ahead. The important thing is finding ways to sustain this dialog so that people can get comfortable with the idea. Of course, reports from earlier trials and visits to successful prior venues is an important way of dealing with these matters.

The Public Transit Management Plan: For the greatest part of cities addressed by this paper most of the travel is by bus, even though there may be some lines of heavy transit, and even though vehicle ownership may be rising. The bus system is typically made up of numerous concessionaires, each of whom owns only one or a few buses. Most of the concessionaires have licenses of limited duration but have succeeded in renewing them without critical review. In many environments there are groupings of bus owners into organizations that have no capital but hold authority over who can serve the lines regardless of concession agreements. Service is of limited quality, equipment is deteriorated and the number of buses is excessive because of the duplication of service in the trunk lines. The police are little help because they are not involved in the concessionary arrangements and cannot be counted on to enforce them.

The most central problem is likely to be the inadequate level of fares to support a good service. Government officers are often very reluctant to permit bus fares to be raised because of the public response to the rise in such a conspicuous element of the cost of living. They may even find it more politically palatable to subsidize public transport from scarce general revenue funds, though inevitably insufficiently. This needs to be reconsidered.

To improve service one possibility is to organize the concessionaires into groups that have official designation and are regulated (which, after a fashion, may already exist). The possibilities then are better public regulation of the concessions—regulating the new ones and obligating the renewed older ones to go by the same rules. One successful move is to then increase the financial and management strength of the bus owner groups so they can rationalize the route system, arrange for joint maintenance facilities, and jointly purchase repair parts and vehicle renovation services. All this requires guidance by a strong public agency. An important outcome could be the creation of cooperative fare revenue allocation through these groups on the basis of seat-km driven. This has been successfully undertaken in certain Latin American cities (BID 2006, presentation by Brennan) with considerable improvement in safety and performance, especially since the drivers no longer race each other to corners to compete for passengers.

This is a difficult set of changes to make, but there are grounds for saying that they are the most important thing a transport plan could achieve because they affect far more people than any other action that could be taken by the plan for most developing cities. This form of system and network integration is surely not easy to achieve. It has been attempted for a number of years without much success, but recently it has made important progress in many cities. These are cities typically with powerful mayors and with good transit authorities, but perhaps also new electronic technologies make these arrangements more possible than formerly because they permit more agile fare charging and collecting, and the use of computer programs for network integration.

System integration is often accomplished at the time of introduction of new technologies, such as bus rapid transit. This is understandable because the new mode changes the supply configuration of the service. The transit plan also deals with the possibility of new transit installations and the choice of new technologies. At the present time there is lively discussion over the choice of recent low-cost, high volume technologies. These new technologies are principally bus rapid transit (BRT) and light rail transit (LRT) both on dedicated rights of way. They are able to provide high volume service (up to 40,000 passengers/direction/hour) at costs much lower (around US $5 to 8 million per km) than heavier forms of mass transit. They have the capability of making new access to the city center available and perhaps overcoming the deterioration of such centers currently on account of increasing congestion, a classical trend during increasing motorization across the world. The planning requires a specialist to deal with issues of required lane space, power sources, and flexibility in service, passenger capacity, and costs.

Freight Transport Plan: This sector is often neglected in transport planning because of a sense that the needs of passenger transport are more pressing and have higher status. In many countries the freight transport sector is in poor
condition—served by individual truck owners whose equipment is in poor condition and whose low profits give them little access to good maintenance or replacement of old equipment. Because the old trucks are slow, subject to breakdown and cause heavy pollution, they are forced to make deliveries expensively at off-hours and to use limited, inefficient routes through cities. Planners may also avoid truckers because they are potentially troublesome politically (viz. their importance in overthrowing the Chilean government in 1971). Yet freight movement is at the core of competitiveness for a developing economy. There is even good reason to favour it over passenger transport.

As a result freight planning as an institutional problem as well as a physical planning problem. It includes encouraging the creation of truckers’ organizations for cooperative benefits, finding means of financing new equipment and relief from important duties, etc. Encouraging the adoption of systems for more efficient truck use that reduce “load hunting” by empty trucks is a possibility. Trucking support by a coalition of industrial interests would be beneficial to all concerned. In the cities conditions would be improved by requiring establishments that receive deliveries to provide practical shipping docks. The creation of intermodal terminals, union warehouses and redesignation of truck routes are other possibilities.

Design of Plan Options

As a culmination to the creation of these individual plan elements it is necessary to design a comprehensive program for action on the urban transport sector. In many cases these individual initiatives can be synergistic, strengthening each other through joint implementation. For example, additional strength to public transport investment is a great support to the viability of traffic restraint measures and vice versa. In other cases they may be mutually conflictive. Promotion of two-wheeler motorized vehicles, while greatly increasing personal mobility of low income families, causes much increased pollution because of the two-stroke engines.

Plan elements need to be composed with awareness of the “Strategic Objectives” chosen at an early stage of this planning exercise in order to become aware of the interactions among plan elements. For example, it would be informing to display the policies and projects that would most advance the goal of economic development—the best management of cargo and work vehicles, even sometimes to the disadvantage of personal travel and the optimal location of new industrial investment. A second outline of policies would be implied by maximizing the role of transportation in making new housing available to the burgeoning urban population—presumably inferring judicious urban decentralization to rapidly increase available housing sites and lower their cost. A third display might emphasized the maximization of trip making opportunities—emplacing high volume modes and the successful resolution of the multimodal use of the streets by bicycles, two wheelers and other vehicles. The goal is a compromise strategy that will arise out of merging commitments to each of the strategic objectives and the projects/policies that represent them. The best way of doing this may be to display sets of alternatives as scenarios, dealing in the decision process with full scenarios of projects, chosen in such a manner as to preserve the synergy among projects. In general, it may be better to discuss sets of interacting projects during the decision process, rather than discuss project one by one.

This needs to be done in a context of budgetary realism. It is clear that setting the bounds of possibilities from various financing sources the prospects can be very difficult to foresee. The viability of a project is likely to be partly dependent on the attractiveness of that project. And it is hard to say whether a bilateral or multilateral international agency will become interested. But there are basics that need to be recognized—such as whether a city can really undertake a metro at US $100m a kilometre or not. Attention should be given to these boundary conditions.

Evaluation Procedures

A formal process of evaluation is basic to configuring a final decision. The basic input is the series of policies and projects assembled in the scenarios developed during the last stage. While hopefully there has been surveillance of the entire process by a committee representing the various participants and stakeholders in the transportation sector, this is the point at which the process is amplified and made more public. As suggested by our whole approach to transport planning there will be considerable disagreement about what actions are the more effective in confronting problems of the sector, as well as those corresponding to vested interests. There needs to be bargaining and compromise.

At the same time there needs to be a technical evaluation that summarizes the consequences of undertaking these different sets of policies and projects together.
Priorities and Programming

This step concerns the sequencing and timing of improvements and the enactment of policies. It is based on the reality that it is impossible to do everything one would like during a short period. Projects have to be placed on a schedule that respects the stream of investment funds available to the sector, maximization of joint productivity of new actions over time, that meets travel demand expectations during the coming years, that makes good use of the installed capacity of the participating public and private entities involved and that keeps implementation of different projects from jointly imposing excessive travel delays during construction.

EXPECTATIONS FOR THE FUTURE

Our most important question is the difficult one: How sustainable can transport be for the future city of the developing world? The answer depends on a number of things. What is the future of mobility fuel for the cities—the supply and prices of petroleum and the costs of alternatives? How committed will we find the politics of environment in the developing world? Will public faith in sustainability concerns rise to commitments of sacrifice? Will there be sea changes in enforced policy?

None of these questions is possible to answer confidently. On the side of hopefulness, there has been a definite tendency for the environmental movement to become serious in one country after another and often surprising actions taken. Until a few years ago there was little indication of environmental sensitivity in India—then shortly after, the front cover of India Today pictured an entire family wearing gas masks! And by now nearly the entire transit fleet of Delhi is off fossil fuels. One would never have speculated 15 years ago that four major Latin American cities would have weekly days of driving ban, but now they do. These are exciting times in urban transportation when governments are increasingly approaching the brink of enacting congestion pricing and adopting new low-cost high volume transit that could significantly change modal use in cities. In contrast, of course, there are venues where government has greater trouble overcoming vested interests in the quest for better environment.

We could confidently venture the expectation that transport global warming effluents will be lower per vehicle in the developing world in 20 years. Is it possible that effluents will be reduced on a per capita basis? This is doubtful because of the rapid increase in vehicle ownership in the developing world, but much depends on the structure of increasing income. China’s rapid motorization, for example, leads the northern observer to suppose that they are on their way toward achieving the full motorization and VMT similar to a northern country. But this is in question. It depends on the structure of increased income. Liberalization of the economy has produced new very wide income differences in China. And rural incomes there are still very low (whereas in the north rural motorization tends to be higher than urban motorization.) But, of course, the bottom line is the total. Under circumstances of significantly increasing populations in the developing world, significant urbanization of those populations, increasing personal incomes with large increases in vehicular ownership and use, our optimism is daunted.

With the problems of global warming continuing to loom through increased documentation, we can expect more serious efforts toward sustainability. This infers more rationality in the selection of actions. Up to now sustainability actions have included numerous “good faith” actions that express valued concern but rather limited results. These efforts should not be dismissed because one of the main goals must be to increase public consciousness and conscience about environment by making sustainability commitments as visible as possible. But we will soon need to come to grips with hard realities. “Directional correctness” is no longer sufficient. In view of the evident possibilities for results from trip restraint and modal transfer policies, should we continue to focus on land development density and bicycle ways as sustainability measures without further proof of their effectiveness—or an indication of policy sea-change that could greatly enhance their impacts?

A final effect to watch for and seek in the coming years is much greater attention to national urban transport policy in the developing countries. The quest for national support by the secondary cities is particularly important. This is taking place for a variety of reasons. First, formerly the only cities with metros have been the capitals/major cities of the nations. Metros are so expensive (about $100m/km) that the secondary cities could hardly be assertively envious (any more than a person of average income is envious of the owner of a 30-meter sailing yacht). But now bus rapid transit (at
sometimes less than $10m/km) is a possibility almost within reach but requiring technical and financial assistance. (A number of Mexican and Colombian secondary cities now have them in service or under construction.) Secondly, through continuing urbanization during the last decades, many secondary cities have become substantial metropolitan areas with large-scale metropolitan transport problems, but without the local presence of the national government for assistance. Thirdly, action toward high volume public transport entails attention to the management of the ordinary bus transport system of the city (because concessionaries are likely to oppose new modes and need to be reorganized to feed high volume lines). Finally, secondary cities are sensing in general that they are falling behind the major national city because the effect of globalism appears to augment economic growth of the main city and leave the others behind, or even deprive them of their economic functions attracted to the main city.

In sum, the absence of national policy to guide urban transport development in cities has long been a very regrettable lack. Special events now exasperate this problem, hopefully finally impelling a solution.

In sum we can be cautiously hopeful on a series of fronts, but really significant movement toward sustainability will require the infusion of major effort from the concerned world community.

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