

URBAN TRANSPORT SECTOR STRATEGY REVIEW CONCEPT PAPER

BACKGROUND

Urbanization of the developing world

1. Within a generation the urban population of the developing world will increase by 2.5 billion – equal to the present day total world urban population - and more than half of the developing world's population will live in cities. Three-quarters of the world's megacities of over 10 million population will also be in developing countries. Urban sprawl is likely to extend, encouraging auto-dependency, disadvantaging public transport service supply and hence reducing accessibility to employment and to urban facilities for the poor, especially those living in high density peri-urban settlements outside the range of existing urban facilities.

World Bank policy context

Urban development strategy

2. In 1991 the World Bank articulated its approach to urban development.¹ A recent review of this strategy stresses that the livability of cities depends on them being economically competitive, financially sustainable and well-governed and managed.² Fostering the development of these institutional characteristics is the primary thrust of the strategy.

Transport sector strategy

3. In 1986, a World Bank policy urban transport policy paper mainly emphasized the importance of managing traffic to secure economically efficient urban movement.³ Since then a broader perspective has been developing on transport sector policy. In late 1996 the Bank published its general transport policy framework which emphasized the essential integrity of economic, social and environmental dimensions of a sustainable transport policy.⁴

The Comprehensive Development Framework (CDF)

4. The CDF is the current paradigm for the development activity of the Bank. Its essence is the adoption of a more holistic view of the development process to recognize the interdependence between sectors, to identify and concentrate on remedying the weak links in any particular country, and to better co-ordinate the activity of the many agencies involved – particularly the international financial institutions. The CDF philosophy implies the necessity to recognize the role of transport as a facilitator and partner in the achievement of wider economic and social objectives including improved accessibility of health, education and social services, particularly for the very poor and other socially disadvantaged groups. It also emphasizes the need for the review to be a vehicle for enhancing collaboration between the World Bank and other multilateral and bilateral agencies involved in development lending or aid.

¹ *Urban Policy and Economic Development: An Agenda for the 1990s.*

² *A Strategic View of Urban and Local Government Issues: Implications for the Bank.*

³ *Urban Transport*

⁴ *Sustainable Transport; Priorities for Policy Reform*

5. Consistent with this framework the *objectives* of the urban transport review exercise are therefore i) to develop a better common understanding of the nature and magnitude of urban transport problems in developing and transitional economies; and ii) to articulate a strategy to assist national and city governments to address urban transport problems within which the role of the World Bank (and other agencies) can be identified.
6. The *outputs* of the process would be i) an extensive and authoritative knowledge base, available in electronic form through an Urban Transport Strategy web page; iii) a series of volumes of topic or source specific background papers, including region specific policy appraisals iii) a World Bank Urban Transport Strategy. The latter might need to be articulated in different forms, and at different lengths for a range of potential audiences.

APPROACH TO THE PREPARATION OF THE STRATEGY

7. The strategy is defined firstly in terms of the key issues to be addressed and secondly in terms of the instruments through which those key issues can be addressed. Pervading all aspects of the review it is intended that attention shall be heavily focused on the process of change.
8. Three **key issues** are considered.
 - First, given the primary concern of the Bank with *poverty reduction* is the extent to which, and ways in which, transport policies can contribute to this end.
 - Second, given the typical role of large cities as the engines of *national economic growth*, is how efficient urban transport facilitates growth, including means by which movement is provided for and managed.
 - Third, given the broader concern about the *quality of life*, are the ways in which urban transport policy impacts upon the physical and social environment in short and long terms.
9. Three main **types of instrument** are considered.
 - First, are the *institutional* arrangements through which urban transport policy is implemented.
 - Second, are the *financial and fiscal* instruments used to ensure both economic efficiency and to ensure sustainability.
 - Finally, are the traditional *physical* instruments, including the provision of infrastructure and its management.

KEY ISSUES

Poverty alleviation

Understanding the poverty impacts of urban transport strategy

10. Transport affects urban poverty in a variety of ways. Direct impacts include the effects on the access to employment and hence the living standards of the very poor as well as their access to health, education and other social services. Indirect effects include the impact on production costs and hence on general levels of income and employment, and on the

distribution of the benefits of growth. Effective targeting of interventions aimed at assisting the poor is particularly important.

11. Access to employment is critical to the urban poor. In some countries the location of the very poor, in peri-urban informal settlements severely hampers access, both because of the distances involved when formal sector employment remains highly centralized and because of the inaccessibility of the informal settlement areas to conventional public transport vehicles. High dependence on walking over long distances debilitates and further reduces the employment potential of the poor, and is often associated with very high rates of road accidents, which affect the poor more than the rich, but receive scant government attention.
12. One of the most critical areas in developing this focus is the need for knowledge of the transport facilities actually used by the very poor, as well as an understanding of the characteristics of existing transport arrangements that are most damaging to them.⁵ Much remains to be learned about how the poor adjust to poor transport (in terms of their activity patterns, trip patterns and ultimate sources of livelihood) and about the efficacy of interventions directed at improving accessibility for the poor (including infrastructure development, public transport service, pricing and subsidy policies and mechanisms). A liberal approach to the entry of new public transport service suppliers, which at least gives choice, might be the most beneficial policy, particularly when no public subsidy funding is available. The review will collate evidence on these topics as the basis for assessing the poverty impact of urban transport strategies.
13. In the wider context of urban development strategy and poverty reduction, it is also important to develop a better understanding of the relative effectiveness of interventions in different sectors in poverty reduction, as well as an appreciation of the extent to which good transport is a necessary condition for the success of other interventions. That requires the development of better indicators of poverty impacts of different interventions.

Socially disadvantaged groups

14. *Age* clearly imposes specific disadvantage in transport terms. A disproportionately high percentage of road fatalities is represented by children. For the elderly, public transport accessibility is often very poor and pedestrian facilities are often non-existent or blocked by parked cars. The review will elaborate on the needs of these groups.
15. *Gender* related disadvantage is of particular concern. Many typical female activities (child-care, household management, informal sector employment, etc) imply differences in transport needs in terms of routes, schedules, types of transport. Women might thus be expected to take more, shorter trips than men, more trips at off-peak hours and off the main routes, and engage in more complicated trip patterns, all of which might make the transport of women relatively expensive to provide for, per person kilometer. That expectation needs to be verified.
16. For these reasons, provisions for many womens' trips may be of relatively low quality, or high price. In many countries there is also a problem of the "social safety or security" of public transport for women, especially in the evening hours, which may also force them to depend on more expensive alternatives. Women are very vulnerable to such cost characteristics. They often have limited control over the household budget and consequently have less capacity to pay than male household members, who also control bicycles and other IMT available to the household. Cultural factors, and sometimes even physical inability to

⁵ For example, social survey work undertaken in connection with recent urban public transport projects in central Asia has suggested that it is the *availability* of service, as much as its cost which is damaging to them.

fight for space on crowded vehicles, may constrain women's ability to use public transport. Furthermore, because conventional transport planning is driven by willingness to pay (either demonstrated in the case of commercial services or synthesized from behavioral studies in the case of public infrastructure), relatively low value tends to be assigned to many of these dispersed transport needs of women. As a consequence, much of women's travel in very poor countries is on foot. This also receives low priority in much transport planning. Participatory planning methods often do not fully involve them.

17. Attempts to address these issues, including "women only" buses, reductions in import duties on bicycles, better credit mechanisms, community awareness programs to overcome cultural constraints to women's use of IMT, have rarely been rigorously evaluated for either economy or sustainability. There thus remains a heavy agenda of gender related research, including more activity, as opposed to trip-based, research; better estimates of the economic value of women's time; and direct evaluation of the impacts of some gender related projects.
18. *Involuntary displacement* in the process of development, including transport infrastructure development, can be a significant source of immiseration. Transport reform has also often been associated with substantial severance of redundant staff. The identification of the distributional effects of infrastructure works and of reform policies, and the fuller involvement of project affected persons in decisions through consultation at the project preparation, are sine qua non for addressing these concerns.
19. The poverty focus of urban transport policy must also be seen in a wider context. The deprivation of the transport disadvantaged may be part of a wider cultural issue. Where it is, the core social bias needs to be addressed at the same time in order for sector specific interventions to be fully effective. Furthermore, increasing the efficiency of urban transport may be a powerful way in increasing general income levels to permit a reduction in absolute poverty while there may be more cost effective ways of addressing distributional issues than through urban transport policy. Those issues of policy balance will be addressed.

Economic growth,

20. Cities are widely regarded as the engines of growth in the economies of developing countries, and transport impediments to the efficient working of the city economies are of critical concern to the sustainability of the city economy. Those impediments may arise from the structure of cities or from the way in which passenger or freight transport is performed.

Urban form, transport and economic efficiency

21. Inappropriate land-use structure may inefficiently lock in a need for excessive travel for generations to come, resulting in high infrastructure costs almost always accruing to the public sector, high private costs of basic accessibility to households, and attendant negative impacts on air quality, congestion, GHGs and accessibility for the poor. The broader economic implications may also be important. For example, though China can ill afford urban sprawl which eats up valuable arable land, officials are slow to control it. The critical issues to be addressed concern the relative merits of alternative urban forms and the extent to which urban transport infrastructure and service provision can pull land use allocation in useful directions.

Person movement; the role of motorization

22. Closely linked to the issue of urban form is that of motorization. The private automobile is widely perceived both as the most flexible and comfortable mode of transport. Despite

recognition of its role in causing congestion and environmental damage, anti-car policies are politically unpopular. In many Western countries, this issue is finessed by distinguishing between policies targeting motor vehicle ownership (which are generally avoided) and those targeting their use. In contrast, many developing countries have very weak capability to manage or restrain use. Moreover, in some very large developing countries such as China, Korea, India and Malaysia, the auto sector is seen as a major focus of industrial development (although the temptation to adopt pro-auto policies for this reason may already be declining with the globalization of the auto industry). The problem of reconciling pro-auto industrial and person transport policies with protection of urban efficiency must be addressed.

23. Passenger vehicle movement has traditionally attracted the bulk of attention in urban transport planning. From an economic viewpoint this focus is misplaced, as it is the quality and economy of movement of people, and not of vehicles per se, which is crucial. The World Bank already emphasizes the needs of public transport, as the most space efficient mode, in identifying many urban transport infrastructure investment and management initiatives. It is still not clear, however, how well that focus on people rather than vehicles has been worked out, and the review will assess policies in this light.

Urban freight

24. *Urban freight movement* is often given little attention in developed countries, largely because it usually contributes relatively little to peak hour congestion. In developing countries, where freight traffic accounts for a larger proportion of the total, that neglect is more difficult to justify. Unfortunately, data on freight traffic flows in developing country cities is usually very inadequate. We have even less understanding of the decision processes which determine these flows. At the very simplest level this includes choice of locations by firms, mode choice decisions by logistics managers, route and time choice decisions by drivers, and location decisions by firms. At a more sophisticated level it requires understanding the integral part which transport plays in the logistic structures of firms and industries in an increasingly global economic structure.
25. The issue has extensive policy ramifications. In *industry policy* it raises questions concerning of the public sector role in activity structuring. In *land use policy* it raises questions on the optimal location of commercial activities and the instruments that may be used to achieve it. In *urban transport policy* it raises questions about the public role in the provision of multi-modal freight infrastructure and about the treatment of freight within urban traffic management and restraint policies. Finally there are some *technological* questions to be answered concerning the role of advanced information systems in improving urban freight movement in developing countries. The review will therefore pay attention to the impact of freight transport arrangements on the economy and environment of cities.

Quality of life

26. Urban transport has a wide range of effects on the quality of life. Positive effects include improvements in accessibility and the associated broadening of the scope of human activities, better social interaction and social cohesion. Negative effects include air and noise pollution, accident damage, as well as the visual impacts and the compartmentalizing effects of transport infrastructure and traffic. Of critical significance in the longer term are the effects which transport system quality has on the patterns of urban development.

Local Environment and energy issues

27. There is already a large reservoir of knowledge on the contribution of traffic to urban air pollution amongst environmental specialists.⁶ But much of this information is not widely disseminated or understood by transport specialists, with a consequence that counterproductive policy initiatives occur.⁷ In addition, it is not easy to distinguish areas (like introduction of unleaded fuel) where there is practical experience that can be replicated, from other areas (like vehicle replacement programs) where further work is still needed to reach a consensus on what can be successfully achieved.
28. Developing a consistent strategy thus requires improved knowledge and action in the following areas.
- (i) *Establishing priorities.* Assessment of the level of urban transport pollution relative to other pollutants in a given city, in order to determine where it is most economic to concentrate efforts to improve air quality.
 - (ii) *Fuel strategy.* The desirability, content, and implementation procedures for global clean fuel standards; the cost effectiveness of refinery modification; the role of available alternatives such as LPG and CNG; and the role of taxation policies to encourage use of clean fuels.
 - (iii) *Vehicle engine standards.* The desirability, content and implementation procedures for generic global standards for clean engines; as well as the design of cost effective dirty engine replacement programs, including that of 2 stroke by 4 stroke motor cycles.
 - (iv) *Infrastructure strategy.* Criteria for noise and pollution standard setting adjacent to new urban infrastructure in poor countries; procedures to mainstream WB EA/LARAP requirements so that WB projects are not special cases; the adequacy of current environmental assessments to address the issues generated by urban transport projects; and the relationship of urban transport environmental regulation relate to national regulatory structures.
 - (v) *Monitoring and enforcement.* Design of effective, corruption free I/M programs in developing countries; and the reallocation or establishment of effective co-ordination between multiple agencies for setting and enforcing vehicular emission standards.
 - (vi) *The role of management solutions.* Assessment of the likely cost effectiveness of the use of traffic management, public transport, longer term demand management measures and public education programs as means to improve the environment.

Climate change impacts

29. Greenhouse gas emission, has tended to receive less attention than local air pollution in transport projects. While there have energy efficiency projects that aim to reduce GHG emission reduction in the transport sector, these are relatively rare. “Global Overlay” research has developed new approaches to the evaluation of GHG reducing policies. The recent GEF OP11 opens up the possibility of finance to support some of the less direct means of reducing fuel consumption such as cycle paths or land use planning studies or experiments aimed at reducing trip lengths. How such efforts might be best furthered will be addressed.

⁶ The local air pollution impacts of transport are addressed in many types of World Bank operations. These include transport projects, energy projects addressing fuel quality, urban air quality projects that have a component on pollution from traffic,⁶ as well as reports that address transport–downstream petroleum sector–air quality linkage.

⁷ Examples include asking that vehicles meet Euro 2, when diesel with 0.05 mass percent sulfur is not available in the country, or recommending retrofitting diesel buses with oxidation catalysts, when the sulfur level is high.

30. The greatest hopes still attach to fuel pricing, which has demonstrably been the strongest instrument available because of its efficient incentive effects over a wide range of types of adjustment behavior. Some of the most perverse and damaging fuel subsidies have begun to be eliminated. Given the usually low price elasticity of demand for fuel, and the attractive distributional effects of taxing fuel in many low income countries which are very short of public funds, one might expect an increasing convergence between macro and micro economic pressures. But there is still surprising resistance to such initiatives which this review should attempt to understand more fully and identify ways of combating.

Urban Transport Safety

31. Safety, and particularly road safety, is a global problem of which policy makers show remarkably little awareness. That is now being addressed through the Global Road Safety Partnership. It is proposed that urban transport safety issues and policies should be developed in the review through collaboration with GRSP. Important issues to be addressed include (i) the lack of data collection and analysis systems, (ii) the lack of institutional capacity in terms of analyzing accident data, developing and implementing policies (managing capacity) and to design specific interventions (technical capacity), (iii) inadequate legal frameworks (traffic and transport laws), (iv) lack of financial resources, (v) insufficient judicial support, and (vi) inadequate enforcement.

INSTRUMENTS

Institutional arrangements

Jurisdictional and functional reform

32. There are a number of policy decisions, such as the level and structure of fuel taxation and vehicle emission standards, which are critical to the urban transport situation but where the jurisdictional responsibility lies with central government. A first requirement for effective urban transport policy is thus that central government ministries concerned are aware of the impacts of their decisions on the responsibilities of other jurisdictions. This review will identify the range of such interactions and explore the ways in which acceptable outcomes can be ensured in complex jurisdictional environments.
33. A more commonly recognized jurisdictional problem concerns the appropriate spatial scale for urban transport responsibilities in larger conurbations. Many of the world's largest cities, particularly in Asia and Latin America, contain several autonomous municipal jurisdictions, sometimes overlaid with regional, state and central government powers which compete or conflict. The fact that even when conurbation authorities have been established, they have not always survived, triggers many difficult questions. How can the negative impacts of competition between local jurisdictions – including duplication of services and land consumption and private developers playing one jurisdiction off against another – be mitigated? Can regional tax-sharing or financing structures help facilitate transport / land-use coordination across jurisdictions? Is regional or metropolitan government needed to do this?
34. Even within the transport sector there may be different levels at which particular functions may be most effectively handled. For example, conurbation parking strategy, including the determination of charges and quantities to be provided might best be viewed in the context of a city regional level strategy while parking management and enforcement is much more likely to be handled efficiently at the very lowest level in the spatial hierarchy. The review will explore how different spatial scales for different urban services can be accommodated.

35. Similar problems arise in the functional dimension. For example, the fragmentation of administrative and legal responsibilities between separate agencies for road building, traffic management and safety, environmental issues and public transport, is a major problem in China. The determination of where boundaries are helpful and where they are not is a very important aspect of urban transport organization. Designing institutions and procedures to ensure effective co-ordination of inter-related policies is a critical issue to be addressed.

Land-use policies and plans.

36. Given that transport demand is both derived from existing land use patterns and has the potential to mould future land use patterns, the way in which urban land markets work is very important. It is necessary first to ask about the nature and extent of market failure in the land market. Does land-speculation induce more transport-intensive settlement patterns and lifestyles? If so, can and should it be controlled, especially on the urban fringe? Are "urban growth boundaries" (such as used in Korea as well as many OECD countries) an effective and enforceable way of countering the adverse effects of land speculation?
37. A second set of questions concern the instruments of land use planning. A range of mechanisms are used in developed countries for enforcement of land-use plans, including zoning and permitting, common law controls, expropriation, public land-banking and other command and control mechanisms. Each of these pose special problems in the developing country context which will need to be discussed.
38. Finally the review will address the administration of land use policies. How effectively do land-use plans really control land development? Are some "nesting" structures for land-use plans in multi-jurisdictional arrangements more effective than others? Should land-use plans be drawn up in concert with transportation plans and how much emphasis should be placed on land-use planning in transport project preparation? How can non-cooperating transport and land-use planning agencies be brought to work together in short and long terms?

Public transport organization and regulation

39. Failing parastatal public transport supply organizations in many parts of the world, including Africa, the FSU and even some Asian cities such as Bangkok, are increasingly supplemented or replaced by the private sector. In many countries this has involved very fragmented and often low quality service, largely from the informal sector. In OECD countries, in contrast, competition has tended to be for the market, through competitively tendered franchising systems, rather than in the market. Similar arrangements are also being adopted, rather hesitantly, in some FSU countries.
40. The review will consider the potential and performance of a range of urban public transport regimes and regulatory structures, ranging from traditional parastatal monopoly to totally free markets. Franchising systems pose some very difficult questions to public authorities in developing countries. How should route structures be determined? Do they need to specify public transport vehicle size? What vehicle and service standards should be asked for? How can disciplined performance be obtained from the informal sector? What is the role of operators associations? How should fixed track systems be approached within urban franchising systems? Who should regulate what under different supply regimes? In addressing these questions the review will pay particular attention to the ways in which the public sector capability to manage competitive urban transport regimes can be developed.
41. Despite this emphasis on the development of competition, it is important to recognize that in some countries, such as China, traditional public enterprises are still dominant. It will

therefore be necessary to consider both how these agencies can be made more efficient as well as considering the process through which the systems in which they operate can be made more commercial and ultimately competitive.

Non-Motorized Transport

42. Non-motorized transport is frequently associated with poverty as something that countries aim to develop out of, rather than to cultivate and improve. Nevertheless it still plays a dominant role as the least costly, although sometimes most unpleasant and dangerous, main mode of transport in some of the very poorest countries. In those cases the issue is how to preserve and enhance the benefits of NMT while managing its interface with motorized modes and providing fair choice between transport options.
43. Pedestrian movement is universal. Whatever main transport mode is used, ultimately everybody must walk a few yards, (or often a few miles in developing countries) to reach their final destination. Most countries lack design standards for pedestrian facilities and safety, or institutional capacity (including relevant expertise in engineering departments) the financial resources, regulatory frameworks and enforcement capability to sustain them. This is often compounded by the weakness of pedestrian advocacy groups in the absence of any powerful commercial sponsor such as the car or bus manufacturers.
44. Cycling is playing an increasing role in a number of high income industrialized countries, both as a main mode (as in the Netherlands for 30% of trips), and as a convenient and non-polluting local distribution mode in multi-modal systems (as in Japan). That trend has been stimulated by provision of separate infrastructure protecting bicycles from dangerous conflict with other vehicles, and attractive modal interchange facilities. However, proper provision for bicycle use requires a cultural change in many developing countries, including provision for training in design and maintenance of bicycle and pedestrian infrastructure; development of the legal framework to protect bicyclists, to enforce the law and to prosecute violations and consideration of the financial impediments to cycle use such as high import duties and inadequate credit facilities. The review will also consider other forms of NMT, such as cycle-rickshaws and trucks, and comment on the appropriate roles for NMT at different stages of development and the necessary public sector actions to facilitate those roles.

The informal sector

45. In many developing countries the informal transport sector is the main provider of affordable public transport and a major source of employment for the low skilled poor. It has effectively saved the public transport systems of many FSU countries from total decay in recent years. Yet, like NMT, it is often associated with economic failure, and illegality and is hence seen as having a diminishing part to play as development occurs. That raises some important questions concerning the role of the informal sector in countries at different stages of development? How and to what extent does it contribute to poverty alleviation? Are there any systematic biases against it? Should greater effort be made to bring the informal sector into the tax net, and if so how? And to what extent can governments mobilize the potential in the sector by encouraging the development of informal sector public transport operators association within franchising regimes? How should safety and quality be controlled for informal sector services?

Corruption

46. Many of the institutional reforms discussed in this review could be massively negated by corruption. It is therefore important to consider how procedures for land use planning,

infrastructure network planning, tendering, procurement, concessioning and franchising, traffic law enforcement, vehicle inspection and privatization can be designed to minimize the scope for corruption.

Fiscal Instruments

The Fiscal Implications of Market Failures in Urban Transport

47. The urban transport sector is subject, to an unusual degree, to conditions under which markets will not necessarily produce a social optimum. These “market failures” include the existence of external costs of congestion and environmental impact, which also involve interactions between transport modes. In addition, the distributional effects of urban transport policies are a matter of particular concern. It is therefore necessary to look closely at the extent to which the charging and financing arrangements for infrastructure and services achieve the social objectives of the sector.

Direct charges for use of public infrastructure

48. For congested conditions, where the marginal social costs of travel are high, the World Bank has long advocated the use of the pricing mechanism as an instrument to restrain demand in order to make the most efficient use of scarce road space. A whole panoply of arguments – dampening of economic activity, inequity, technical incapacity, implementation cost, democratic unacceptability – have been raised against it, and there is little success to show in its implementation even in the most developed and technically advanced countries. However, there is an increasing body of opinion that congestion charging is an idea whose time is ripe.

User charges for public transport

49. For public transport pricing, an even more complex set of objectives are often adumbrated, including affordability, efficiency in multi-modal systems, road congestion and environmental impact reduction.

50. In efficiency terms there are a number of questions on public transport fare levels and structures that need to be revisited. Given the aim of encouraging public transport use, is subsidy desirable and, if so, should it be directed at keeping fares down or level of service up? Where and when are flat fares desirable, taking into account both their short term effects on welfare distribution and their longer term effects on activity location and urban form? What are the prospects for multi-modal ticketing systems in urban areas, especially given developments in electronic charging? Are there dangers of integrated fares systems for poverty impacts, as average fare levels are ramped up to support more expensive urban rail systems? How are the benefits of such systems really distributed?

51. The use of subsidies as an instrument of welfare distribution poses several fundamental questions. First, are urban public transport subsidies a good vehicle for broader social and economic policy in any case? Can they be sufficiently well targeted to ensure that scarce resources go to support the objectives (whether it be distributional, environmental or congestion reduction)? Is it helpful or dangerous to designate some target proportion of disposable income devoted to household transport as the limit of acceptability of fares?

52. These questions also have an institutional dimension. Both in the high income market economies and in the socialist economies government has been traditionally determined fare

levels and structures in the knowledge that the financial implications of such decisions would be automatically accommodated through the budgetary process. With the decline of fiscal capability in both types of economy, and increasing reliance on competitive supply mechanisms, new questions arise as to who should determine fares, and how; whether cross-subsidy has any continuing role to play; and what are the implications of the aspirations of municipal governments with respect to fares and subsidies on the choice of market system and regulatory regime.

53. In the context of increased reliance on private sector supply of public transport some difficult problems are also emerging in respect of the sources of finance for vehicles, particularly in the transition economies. Should money be lent to the public sector in these circumstances, and how can one ensure that any such lending does not simply buttress moribund public sector organizations? What are the alternatives? What leasing arrangements work in developing countries? What is the experience with lines of credit for vehicle finance? To what extent is the efficient development of the urban transport sector hampered by inefficient banking systems? What can be done to encourage private sector development in the absence of adequate financial institutions?

Indirect charges

54. Provision of transport infrastructure facilities usually results in an increase in nearby land value, often referred to as "betterment". This raises the question whether there are market mechanisms that would adequately allow the public sector to secure payment for infrastructure services by beneficiaries indirectly through taxing this betterment. In what circumstances can it be applied? Is a conventional value-based real-estate tax regime capable of recouping betterment, and, if so, under what circumstances? Are there particular arrangements, such as a split-rate tax, which might make be better suited to equitable recoupment?
55. Various other tax policies associated with housing, income, or car ownership/use can distort land and housing markets. Examples of such policies include mortgage interest tax deductions, tax deductions to defray commuting costs, hidden distortionary rules in structure of housing and commercial real estate finance, i.e. secondary mortgage markets, etc. In some countries, such distortions might favor greenfield development at the urban fringe rather than re-development in central locations with adequate existing transport facilities. To what extent do current Bank housing and land-market strategies contribute to such distortions? How extensive is such a problem in developing countries?
56. Indirect charging to finance operating subsidies also raises some special problems. Does payment of subsidy costs by identified line agencies responsible for beneficiary categories work? What are the effects of fare controls in the absence of compensation arrangements? What are the merits of employer funded subsidies such as the "valeur transport" in Brazil or the "versement transport" in France?

Local taxation

57. The funding of urban transport expenditure must be seen in the broader context of municipal finance, which is often very weak. That raises questions both about the way in which funds are raised and the way in which they are distributed. On the sources of funds, what are the merits of local property taxation or for local payroll taxes? What is the role of Municipal Development Funds? On the allocation issue, can local taxation be justifiably earmarked for transport in general or for public transport in particular? Can the normal arguments for

“second generation road funds” be applied in the more complex, interacting, environment of urban roads? If not, what is the case for and experience with multi-modal Urban Transport Funds?

Compensation for severance and resettlement

58. A strong stand against perverse distributional impacts of development has been taken by the imposition of rigorous conditions on the treatment of involuntary resettlement in World Bank projects. But some issues remain. In particular, there is a fear that the pressure to avoid resettlement, distorts the selection of projects in ways which actually do more harm than good to the poor (for example, by omitting urban road improvements which would yield dispersed environmental and safety improvements because of the resettlement implications).
59. The World Bank facilitated the occupational adjustment process in the case of the reform of Argentine railways through Structural Adjustment Lending, and has now provisions, used in the Brazil railway privatization, for financing severance adjustment from project loan funding. The extent to which this is necessary to achieve the reform, and a socially acceptable and productive instrument from the view of displaced workers will be considered.

Physical interventions

Road infrastructure investment

60. Assisting in the production of urban transport infrastructure has been a traditionally large activity of the IFIs. The dangers of doing this in the absence of an appropriate framework for the management and maintenance of the infrastructure is now commonly appreciated, and has led to a quite proper shift of emphasis to assisting the development of institutional and financial structures which will ensure the proper management and maintenance of the capital stock without persistent recourse to further borrowing for rehabilitation or replacement.
61. The specter of over-investment in urban road infrastructure haunts many environmentalists who fear that primary road investments will generate sufficient extra traffic to negate any congestion or environmental benefit attributed to them. At the technical level this raises questions about the extent of new traffic generation. At the political level it raises questions about the willingness of local administrations to implement and enforce the traffic management measures necessary to ensure that new investment leads to congestion and environmental relief. And for the financier it raises the question of how to accommodate this degree of uncertainty in urban road appraisals. Given the continued outward growth of the megacities this problem must be addressed in the strategy review.
62. But that does not necessarily eliminate the need for public sector investment. The evidence of cities such as Bangkok, and to a lesser extent Seoul, where the proportion of land space devoted to transport is abnormally low, suggests that there may be a minimum basic density of road which is necessary for efficient city operation. If that is correct, how should that minimum requirement be defined at an operational level? And should not the IFIs be as pressing to ensure that this minimum requirement is provided as they are to avoid over-investment? Similar questions arise about the effects of road network design and functional classification of roads on urban structure and performance.

Designing safe roads

63. The emerging recognition of the severity of the urban road safety problem in developing countries emphasizes the importance of including traffic safety audits in the design and construction phases of urban roads. Timely inclusion of safety interventions reduces their costs considerably, and may also help to reduce resettlement needs: for example, by reducing ROW's in densely populated areas to reduce speeds, by including traffic calming measures allowing less space between the road and frontage development, etc. There are also many questions of an engineering nature. Are special urban road engineering standards required? Should urban pavements be designed for particularly long life? What does that mean in terms of design standards and materials? Are specifically urban vertical and horizontal alignment standards required? Should comprehensive utility development be incorporated in all new urban road construction, and if so, how can it be organized?

Urban road maintenance

64. Urban road maintenance is a very serious problem in most developing countries. The sources of this problem are typically institutional, responsibility resting with municipal authorities with insufficient financial resources or fiscal powers to meet their obligations. The fact that the solutions to these problems being adopted for inter-urban roads are not being so readily applied in urban areas raises a number of strategic issues for this review. Are there good models for the financing of urban road infrastructure maintenance? Can urban road maintenance be effectively contracted out? Has labor based construction any part to play in urban areas? Is private sector participation in urban road infrastructure supply helpful, and if so how should it be facilitated? Are urban toll roads part of an effective solution?

Fixed track systems

65. The Bank has traditionally been cautious of urban rail investments because of concern about the burden of rail based systems on municipal finance. As a consequence, much of its recent activity in urban rail transport has been devoted to mobilizing private sector finance and management through BOTs, concessions and other forms of private-public partnership. The performance and possibilities of those devices needs to be reviewed.
66. The Bank has recently reviewed the role of fixed track systems in a more strategic context.⁸ But some critical questions remain. What evidence is there on the structuring effects of rail infrastructure, and are they superior to those of road infrastructure?? Are the traditional methods of economic evaluation of fixed track systems adequate given the potential structuring effects? How significant is adequate interchange infrastructure provision and how can it be privately financed? In particular, the balance of advantage between bus priorities, busways, LRT, and heavy rail mass transit systems needs to be reviewed in the light of recent technical and organizational developments. At the end of the day, however, the effect of a fixed track investment on the financial sustainability of the city remains critical.

Demand management

67. *Demand management* (DM), involves controlling the use of vehicles to improve performance through *reductions in the total volume of traffic*, particularly at congested locations and times, in order to improve system performance. It is no longer accepted that the role of planners should be to predict demand for transport services/facilities in a future given year and to simply provide services/facilities to meet that demand (the "predict and provide" paradigm). But there remain serious questions concerning the appropriateness and effectiveness of the

⁸ S Mitric. TWU Discussion Paper 28.

instruments of restraint. First, what is the impact of restraint on travel patterns and what is its ultimate economic impact? Second, in what circumstances is demand management, of any kind, politically feasible in developing countries, and if there are no prospects for demand management what are the implications for the whole of urban development strategy? Third, what instruments are most likely to be effective in current conditions? Is road pricing any more inequitable than other instrument, such as fuel taxation or various kinds of physical restraint. How sophisticated need demand restraint instruments be? In what circumstances are low technology economic and physical restraint instruments good enough? Apart from restraint through congestion, are there any viable non price related restraint options?

68. The acceptance of demand management could have similar implications for land-use planning. To what extent has a similar "paradigm shift" occurred for land-markets? Should the role of land market "planners" be to simply ensure that the supply of land meet future expected demand? Can demand for land be managed or channeled? What models are available for such demand management? How applicable would such demand management be in developing country contexts?

Traffic management

69. In contrast with demand management, *traffic management* (TM) involves the use of controls on the use of infrastructure and the behavior of vehicles *to improve the effective capacity* and performance of existing infrastructure. The 1986 World Bank Urban Transport paper placed considerable emphasis on the roles of traffic management and demand management as means of improving urban transport performance by making the best use of existing capacity. That still appears to be a sensible starting point and much has been achieved in the introduction of one way systems, signal controls, etc., even in such intractable situations as Bangkok. But the problems faced in securing political and public acceptance of urban traffic management tools raise the question whether it is some inherent weakness in the instruments, or failures of imagination or conviction in implementation which have limited their impact.
70. There are several distinct areas of uncertainty in designing TM programs for developing countries. First, is the *role* of traffic management. Can well designed and managed TM prevent gridlock on its own, or is demand management needed and/or a minimum basic density of road network? How can reasonable standards of expectation of the performance of well designed and implemented TM systems be defined? Second, is the *content* of traffic management strategies. Given the predilection of police to override signal systems and to concentrate on maximizing the apparent movement of vehicles through single junctions, how can objectives be defined and control systems managed to ensure optimization on a more system wide taking into account effects on pedestrians and cyclists? Should all urban transport projects with road investments have a TM component? Third, is the *institutional context*. Given the typical overlap of functions and differences of objectives of police departments and urban transport planning departments, what are the best institutional arrangements for sustainable TM? How can TM be made politically and professionally high profile? How can current problems with procurement of ATC in WB projects be overcome?

Information technology

71. There are broader applications of new technology than road pricing which also need to be considered in the strategy review. In particular, it is necessary to consider the strategic implications of developments in information technology (IT). What is the likely effect of IT developments on life style and working arrangements, and hence on transport demand? Can intelligent transport system technologies (ITS) be used to enable developing countries to leapfrog into solutions more difficult in developed countries due to existing infrastructure &

services? What ITS technologies have prospects for developing countries? And for the World Bank there is inevitably a problem of how to balance national desire to develop indigenous ITS technologies with normal WB procurement requirements for ICB.

THE IMPLICATIONS FOR WORLD BANK OPERATIONS

72. The strategy document will be concluded with a section which draws the implications of the strategy analysis for Bank operations, including recommendations on general policies, specific instruments, and the desirable composition of regional and Bank-wide lending programs. It will also consider the relationship between the bank and other lending and donor institutions, and the relationship of urban transport sector activities to other activities of the bank within the Comprehensive Development Framework.