

# TOWARD SUSTAINABLE URBAN MOBILITY

Global trends, such as rapid urbanization and motorization, pose tremendous challenges to urban mobility and accessibility. Yet, the changing context within which these are occurring, and the experience it is generating, present new opportunities for advancing innovative policies and programmes for sustainable development as a whole. The previous chapters have discussed the scope and depth of numerous contemporary challenges and best practices in urban mobility and accessibility worldwide. This closing chapter ties the analysis together and focuses on practices, policies and strategies that can be implemented, not only by local authorities but also by national governments. The crux of this chapter is an elucidation of the concrete ramifications of key messages espoused in the report pertaining to the shift from focusing on improving the efficiency of urban transportation to enhancing accessibility in the city as a whole.

Before embarking on policy recommendations it is appropriate, first, to revisit some of the dysfunctional trends that were highlighted in the preliminary chapters and that necessitate the paradigmatic shift reiterated throughout this report. Indeed, the most prominent trend emerging from Chapters 2 to 4 is that, generally, it is becoming more difficult to access places, opportunities and services in many cities of the world. Owing to urban sprawl, distances between functional destinations have become longer; widespread congestion has increased travel time; and high capital, as well as operating, expenses have led to increasing costs of accessibility. As a result, a number of social groups are structurally discouraged from accessing many parts of the cities where they live, and a number of city residents are therefore deprived of the full benefits offered by urbanization. Furthermore, poor accessibility has reduced the efficiency and functionality of many cities in the world.

Another trend highlighted in this report is the steady increase in the share of private motorized transport, including the extremely high motorization

rates in developing countries. This also occurs in regions where the dominant mode of mobility remains non-motorized transportation, such as in the case of Africa and Asia. Apart from the inherent inequity associated with private motorized transport, the negative externalities it generates are quite substantial. It has been revealed that there is a relative stagnation and even decline of public transport in cities of developing countries, even though it constitutes a most effective means of enhancing urban accessibility, as well as of promoting sustainable urban development.

The report also reveals that the configuration of cities in terms of form, structure and function has been highly influenced by the dominance of private transport infrastructure, facilities and services. The embedded imperative of private motorization as the dominant mobility mode has dictated the layout and design of streets and neighbourhoods; dispersion of densities; and location of functions. Perpetuation of this model in much of the past century has generated a self-replicating crisis of urban accessibility: more vehicles, necessitating more infrastructure, compelling a need for more vehicles, fostering more spatial expansion, calling for additional infrastructure and vehicles, with the vicious circle continuing *ad infinitum*. At the same time, in most cities, the neglect of urban freight distribution and management of freight transport, both in land-use and transport planning tends to make goods transportation a major impediment to sustainable urban mobility and to accessing the city.

Underlying all the above challenges has been a marked distortion in the institutional structures, management systems, as well as legal and regulatory frameworks. Fragmentation among institutions dealing with different aspects of mobility and accessibility is rife. The management principles and norms guiding planning, design and even delivery tend to compound the problems instead of ameliorating them. Moreover, the regulatory instruments are not fully compatible with the demands of sustainability.

**A number of social groups are structurally discouraged from accessing many parts of the cities where they live**

**The configuration of cities . . . has been highly influenced by the dominance of private transport infrastructure, facilities and services**

**The neglect of urban freight distribution and management of freight transport tends to make goods transportation a major impediment to sustainable urban mobility**

Value generation through accessibility has not been optimally utilized in many cities of . . . developed and developing countries

Urban mobility and accessibility are key for promoting sustainable urban development

Urban mobility is finely woven into the spatial, social, economic, political and environmental fabric of cities

It is essential that travel is recognized as a 'derived demand' – i.e. derived from the need for people to socially and economically 'interact'. . . this distinction shifts the focus to 'people' and 'places' and away from 'movement'

The report has highlighted that the world market for railway infrastructure and equipment has been growing at 3.2 per cent a year, and is set to grow at around 2.7 per cent annually.<sup>1</sup> However, the global distribution of metro systems shows a concentration of metros in Europe, Eastern Asia and the eastern part of the US. It is further noted that in mega-cities of developing countries where the mobility demand on major corridors is appropriately high, metros remain the only economically and environmentally viable public transport system. For cities which do not have the passenger threshold for metros and the economic capacity to invest in them, bus rapid transit (BRT) has become a viable option, at least in the short and medium term.

On the whole, the report acknowledges the critical importance of accessibility for enhancing the economies of agglomeration and urbanization. It analyses how the urban function is improved and potential of value enhancement realized through accessibility. However, the report shows that the process of value generation through accessibility has not been optimally utilized in many cities of both the developed and developing countries. In the latter case this has been largely due to the separation and sectoralization of land use and transportation, as well as the inadequate integration among transport modes. In the case of some cities in developed countries, delays and procrastinations in investments and expansion have led to lost opportunities.

The report underlines that urban mobility and accessibility are key for promoting sustainable urban development. They are also directly connected to urban stock and flows – in terms of spatial development and consolidation of the built form. They are therefore associated with value creation, improvement of welfare and enhancement of citizenship. Furthermore, urban mobility systems have the potential to positively impact on material and energy flows. However, these systems have not adequately contributed to the desired outcomes owing to their prevailing shortcomings. This report therefore emphasizes that there is an urgent need to reframe urban mobility policies and practices in order to address these shortcomings.

## POLICIES AND PRACTICES FOR REFRAMING URBAN MOBILITY

The overall challenges as well as positive experiences and practices discussed in this report form the basis for key lessons to be drawn for adaptation and replication. They underline the multi-dimensional nature of sustainable urban mobility in terms of both policy and operational implications. Coherence in strategic interventions and linkages among processes

are some of the essential principles that emerge from the preceding chapters. It is reckoned that the ultimate enhancement of accessibility is neither a function of hardware – be it highways, rail or vehicles – nor an outcome of ad hoc spatial delocalization and decongestion.

This report advocates for a paradigm shift in addressing urban mobility. The signposts of how to make the shift are written throughout the report. The discussion below summarizes some of the key attributes for a recalibration of how cities are designed and planned and how urban transport services are organized and delivered in the quest for more sustainable mobility.

### Holistic and systemic thinking and action

Urban mobility is finely woven into the spatial, social, economic, political and environmental fabric of cities. In charting a path for sustainable urban mobility, it is essential to apply an ecological and systems framework that recognizes this. Many of the contemporary challenges facing cities – for example auto-dependent sprawl, persistent poverty, lack of accountability and participatory decision-making – are structural in nature, rooted in current regulatory, institutional and economic systems and approaches. Only by recognizing the systemic nature of problems (mispricing leads to overconsumption of roads in peak periods; sprawling settlement patterns render public transport systems ineffectual; urban design for machines rather than people creates cities for cars rather than people) can significant headway be made in charting a sustainable mobility future.

### Transport as a means, not an end

It is essential that travel is recognized as a 'derived demand' – i.e. derived from the need for people to socially and economically 'interact'. The end or objective of most travel is to meet a friend, earn income, attend school or purchase a good, not movement per se. Cars, trains, buses and bikes are simply the means to achieve these ends. Making this distinction shifts the focus to 'people' and 'places' and away from 'movement'. This realization envisages cities, neighbourhoods, regions and mobility systems as tools that promote desired societal outcomes – such as liveability and affordable access – with transport playing a supportive role. Operationally, this can take the form of compact, mixed-use communities that dramatically shorten trip distances and improve pedestrian and bicycling infrastructure. Compact cities are less reliant on private cars and minimize distances travelled, thereby conserving energy, land and environmental resources. They are also more resilient, enabling them to better adapt to the vagaries and uncertainties of climate change and other global unknowns.

## Accessibility as a priority rather than transport

Related to this notion of travel as a derived demand and transportation as a means to an end is the core principle of accessibility. Accessible cities not only put places (e.g. homes and workplaces, or ‘trip origins and destinations’) closer to each other, but also provide safe and efficient pedestrian and cycling corridors and affordable, high-quality public transport options. That is, they are **accessible to all**. Recasting the sector’s primary objective as one of enhancing accessibility invariably leads to a different set of policies and strategies, like transit-oriented development and the provision of highly interconnected bikeway networks. These strategies not only conserve land, energy and financial resources, but also help the poor and those without private motorized vehicles to access goods and services within the city. In short, accessible cities are inclusive, resourceful and pro-poor.

## POLICY AND OPERATIONAL ENTRY POINTS

From the above normative framework, the following section presents six policy and operational areas that can be developed to suit different settings and through which accessibility-based sustainable mobility can be achieved. These are: enhancing the linkage between land use and transport; revitalizing urban planning and transport engineering designs; realigning transport infrastructure investment and development; integrating urban transport facilities and service operations; streamlining urban institutions and governance framework; and readjusting legal and regulatory instruments. Each of these is discussed in some more detail in the sections below.

The generic designation of the above categories reflects everyday policy processes. These policy areas have been adopted for this conclusion for two reasons. First, to underscore the fact that the shift being advocated in this report is mainly viable when undertaken within existing institutional structures and processes. Second, to highlight that since these are generic proposals, they would have to be slightly adapted to each city’s unique circumstances prior to actual implementation. Furthermore, the categories are also deemed appropriate because they allow for encompassing a variety of settings and levels of development. However, the overall logic of the six categories lies in their strategic linkage and their cumulative potential for triggering policy and operational change.

## Enhancing the linkage between land use and transport

While the pitfalls of overreliance on technological and supply-side solutions to urban mobility are acknowledged, the important role of transport cannot be discounted. The missing ingredient causing the observed pitfall has been the disconnect between the essence of land use and the logic of transport. This connection needs to be re-established for sustainable urban mobility to be achieved; and it can only be effectively initiated at the highest level – through national urban policy initiatives.

Indeed, the national urban policy is given prominence for this connection mainly because of its role as a statutory instrument that not only articulates a vision for urban development, but also defines the relationship among sectors, agencies and stakeholders. When properly articulated, national urban policy offers the most authoritative instrument for elevating the linkage between land-use and transport planning beyond the bureaucratic and political compromises often reached. As elaborated in Chapter 5, the integration is not simply a technical exercise at the local level. It represents a totality of how cities are at a given time, while also identifying the parameters of their future growth. Substantive guidelines are therefore required to ensure effective harnessing of the dynamic synergy of a given national urban system. These guidelines should then subsequently be translated at the sub-national level – from region, through metropolitan area, to the municipality and ultimately at the neighbourhood and street level.

An integrated approach to land use and transport harmonizes planning of the two processes out of the bounded confines of specific ministry and departmental mandates, turning them into a coordinated and integrated exercise at policy and operational levels. It shifts the focus of planning from placement of structures and designation of land use to that of enabling the realization of people’s needs and everyday functions in the most efficient and sustainable manner. Within this approach, the key challenge is therefore not merely to overcome the separate handling of transport and land-use planning; or even to ensure a juxtaposition of the two. Rather, it is to foster an organic integration of the entire continuum of a multi-modal mobility within a holistic and sustainable land-use system where dynamic synergies are harnessed; interconnections are promoted; and functionality optimized. In the whole process, the aspect of design serves as a main bridge linking the key dimensions and attributes for ensuring sustainability and accessibility.

In many cities of the world, particularly those in developing countries, there is a persisting challenge of identifying whose responsibility it is to take the integration of land use and transport (and ideas such as those mentioned above) from theory to a practical

Accessible cities . . . put . . . trip origins and destinations closer to each other, [and] provide safe and efficient pedestrian and cycling corridors and affordable, high-quality public transport options

When properly articulated, national urban policy offers the most authoritative instrument for elevating the linkage between land-use and transport planning

An integrated approach to land use and transport . . . shifts the focus of planning from placement of structures and designation of land use to . . . enabling the realization of people’s needs and everyday functions

**Sustainable densities are essential for sustainable mobility**

**The value of access is enhanced by increasing the functionality of each place, thus reducing . . . distances [and] the number of trips**

**Practices that . . . can contribute to reducing the prevailing shortcomings of freight distribution in cities . . . include: rationalization of delivery, improving freight facilities and promoting modal adaptation**

**The choice of infrastructure investments are central in determining the choices and options for sustainable mobility**

level. This is particularly the case in view of existing constraints of land geography, activity distribution and evolution, economic and financial constraints, and institutional and regulatory limitations.

The comprehensive integration of land-use and transport needs to be thematically cross-cutting and multi-sectoral. This reflects the co-dependence of urban systems – for example urban growth induced by a world-class high-capacity public transport investment increases the demand for electric power and water capacity, new housing construction and business centres. Multi-sectoral planning also exploits opportunities for economizing on the costs of urban services and infrastructure outlays, such as using rights of way reserved for a new fixed-guideway public transport line to also lay broadband cable, storm-runoff channels and utility lines.

### **Revitalizing urban planning and transport engineering designs**

The strong connection between transport ‘supply and demand’ and urban form is a key theme highlighted throughout this report. These influence and reinforce each other both in positive and negative ways. The various cases highlighted in the report demonstrate that the convenience of mobility and the degree of accessibility in cities are determined by the processes emanating from the relationship between the patterns of transport and urban form in the given setting. From the analysis of Chapter 5 on urban form, and the elaboration of sustainability pillars in the subsequent chapters, an important organizing principle can be deduced. Namely, the linkage between urban form and transport is realized through the optimization of density, enhanced proximity and co-location, as well as improvements in the functionality and inclusiveness of places and facilities.

Sustainable densities are essential for sustainable mobility; not only because of its minimum energy consumption and smaller environmental footprint, but also because it contributes to increasing proximity and co-location. Density can be optimized through the use of regulatory instruments, such as zoning laws and the application of locational incentives, such as infrastructural investments, as well as through design interventions. Compact configurations complemented with transport-oriented development minimize private motorization while making it viable for cities to invest in different modes of public transportation. Different density configurations and gradients are discussed in the report demonstrating the range of options in promoting compactness for sustainable mobility. However, a caution is also registered that while density is necessary, it is not a sufficient condition especially for moderating private car use and for arresting urban sprawl.

The notion of sustainable density is applied in the report in the strict sense of making a distinction

with the condition of overcrowding or with slum-like concentration of populations. The planned optimization of density advocated in this report enables the attainment of economies of scale, making it viable to provide a range of facilities at the least cost. The compactness engendered allows for more public space while also exerting a minimum impact on the environment. Coupled with appropriate design it encourages non-motorized and public transportation, fosters conviviality and strengthens a sense of place.

A related attribute is the need to ensure diversity and mixed-use neighbourhoods. Through the use of planning, a variety of housing types is provided, the location of jobs and housing is balanced and a range of everyday amenities are located within easy reach. Mixed-land use promotes non-motorized transport by increasing proximity and reducing the need to travel, thus allowing for accomplishing many activities with shorter and fewer trips. All this is achieved through the creative deployment of planning and design and innovative transport engineering and planning designs.

The quality of the connection between points of origin and destination is enhanced by the functionality and inclusiveness of those places and facilities. The value of access is enhanced by increasing the functionality of each place, thus reducing not only distances but also the number of trips. Also, the fostering of inclusiveness and a sense of place removes inhibitions and promotes identity and conviviality. Transport engineering design and urban design are central tools at this level and, as demonstrated in Chapter 5, street configurations, transport nodes and neighbourhood layouts are the main areas where interventions take place.

While a lot more research is needed on integrating freight distribution into the framework of sustainable urban mobility through planning and design, there are a few practices that have been developed and that can contribute to reducing the prevailing shortcomings of freight distribution in cities. These include: rationalization of delivery, improving freight facilities and promoting modal adaptation. However, it has been noted in the report that the commercial logic of freight distribution tends to be at variance with most of the principles of sustainable urban development.

### **Realigning transport infrastructure investment and development**

This report acknowledges that the choice of infrastructure investments – particularly budgeting and financing aspects – is central in determining the choices and options for sustainable mobility. It is important that gradual steps are taken to correct the current imbalance in funding and investments between private and public modes of transport. More

public resources need to be allocated to facilities that cater to the needs of the majority of people in both developed and developing countries. The current bias towards roads and highways needs to be corrected so that more funding is assigned to developing and expanding non-motorized and high-capacity public transport infrastructure.

It is particularly important that cities investing in metro, light rail and high-end BRT systems direct larger shares of future growth to public transport corridors. Transport-oriented development can reverse the kind of car-based sprawl that eats into the green agenda of cities. However, it is important that a proper alignment between land-use and transport layout is maintained, otherwise the reverse – i.e. urban sprawl – can be further extended by high-capacity public transport systems.

It is also important that the urban transport sector is treated as an integrated whole through systems financing and pricing. This is best accomplished by pooling fiscal resources into a central fund and distributing them among modes and programmes in accordance with well-defined objectives, such as air-quality improvements and reduced traffic congestion. Such coordinated and centralized financing is today practised throughout the US, Canada, Singapore and Japan. Dedicated, long-term funding is also essential to allow strategic, forward-looking planning, such as preserving rights of way for future infrastructure investments. However, it is important to note that in some cities of developing countries it is easier to negotiate and secure funding for metro, light rail or BRT systems than for meeting the (very marginal) cost of implementing integration facilities with other urban transport modes – such as buses, informal share taxis and cars – at metro, light rail or BRT stations.

Owing to the financial constraints of local governments and increased interest by private investors, the global urban transport sector has witnessed a surge in public–private partnerships. These partnerships are managed through contracts, franchises, concessions and, in some instances, the transport services have undergone full privatization. Public–private partnerships have the potential to inject efficiencies in the urban transport sector and also stimulate innovations, such as market-based pricing and automated toll collection. They may also draw in private capital where public funding is restricted. Public–private partnerships have generally worked best in rapidly growing and urbanizing countries and regions – such as the Republic of Korea and Taiwan (China) – and where there is the institutional capacity to oversee and regulate private actors. This underscores the need to achieve both economic and institutional sustainability. However, this report also highlights the potential dangers of using public–private partnerships in urban mobility projects,<sup>2</sup> as experiences from a number of cities

indicate that the financial risks in such projects tend to be carried by the public at large rather than by the private sector partners involved.

The implementation of principles of economic efficiency is essential to the urban public transport sector, since it has major financial implications on local governments. For instance, while urban rail systems handle large loads, they do so at very high, and potentially financially crippling, costs. The high capital investments and subsequent operating costs needed to support a metro investment must be carefully examined to ensure that local and national governments have the financial capacity to maintain its services. Unless a city's urban densities are comparatively high and financial resources are plentiful, lower-cost BRT investments – as recently implemented by cities such as Jakarta (Indonesia), Ahmedabad (India), Lagos (Nigeria) and Chiang Mai (Thailand) – present a more practical option for investment in high-capacity public transport.

A key point made in this report is that the sustainability of urban mobility systems is highly dependent on the financial models designed to protect the public goods dimension of both land use and the transport system. Among other financing sources, the option of value capture is highly recommended as a complement to public funding. Through recouping the increase of value in adjacent land and converting it into public finance for reinvestment in urban mobility systems, the linkage between land use and transport is reinforced. This approach is also politically appealing as it directly demonstrates the linkage between charges levied and the benefits provided.

### **Integrating urban transport facilities and service operations**

The linkage of transport to land use is not only limited to the hardware and the physical dimensions of the two processes. Transport-oriented development and traffic-calming interventions discussed in this report also involve the systemic and managerial aspects of ensuring convenience, efficiency, aesthetics and safety of mobility. The operation of multi-modal neighbourhood stations; the ambiance surrounding flow of vehicles, bicycles and pedestrian in streets; and the procedures at toll-collection points, have to be synchronized in a manner that ensures a pleasant mobility experience.

The urban transport sector must ascribe to the principle of economic efficiency for the simple reason that waste and unsound expenditures could imply that scarce financial resources are directed to other productive and beneficial societal uses, be they education, healthcare or private consumption. Efficient land-use patterns (e.g. compact, mixed and walkable) allow for less reliance on expensive mobility systems in general. Properly designed transport systems also

**More funding [needs to be] assigned to developing and expanding non-motorized and high-capacity public transport infrastructure**

**Transport-oriented development can reverse . . . car-based sprawl**

**The sustainability of urban mobility systems is . . . dependent on the financial models designed to protect the public goods dimension of . . . land use and the transport system**

**Value capture is highly recommended as a complement to public funding**

**Mobility is indisputably a necessary . . . precondition to economic growth**

**Because transportation is both a private and a public good, . . . a combination of user charges and public support is often needed to efficiently and equitably finance transport infrastructure and services**

**Integrated transportation and urban development must occur at all geographic scales**

**Innovative ideas and policies geared towards sustainable mobility require strong institutional and governance structures to oversee their successful implementation**

contribute to business expansion, increased economic output and employment generation. Indeed, mobility is indisputably a necessary (though not a sufficient) precondition to economic growth and expansion.

Efficiency must underpin management, operational and system design practices throughout the urban transport sector. In the case of high-capacity public transport systems, this can take the form of redeploying buses and equipment to high-ridership markets that produce the highest fare-box returns. In doing so, it is necessary to adopt the regulations that allow operators to develop ‘out of fare-box’ financing resources such as value capture, advertising at stations, stops and vehicles, etc., in order to cross-subsidize services, thus, reducing or eliminating government subsidies. For non-motorized transport, it might mean building bikeway overpasses at busy junctions where careful cost–benefit calculations reveal a net societal gain. The report highlights the difficulties faced by cities of developing countries in securing funding to cover construction and maintenance costs of non-motorized transport infrastructure, from both public and other sources. As non-motorized transport facilities are not revenue generating, they are rarely attractive to international funding agencies or the private sector. Efforts are needed to reach innovative ideas that point out the environmental and societal gains made from non-motorized transport.<sup>3</sup> For urban goods movement, night or off-peak deliveries, freight stations and consolidation centres that allow shared-use of delivery vehicles, and bicycle carriers suited to the constraints of urban circulation, might be called for. For parking, efficiency might be achieved by installing sensors in parking stalls to monitor occupancy so that charges can be varied according to demand and motorists can be real-time navigated to the closest available parking space.<sup>4</sup>

Because transportation is both a private and a public good – conferring benefits to both individual users and society at large – a combination of user charges and public support is often needed to efficiently and equitably finance transport infrastructure and services. User fees, such as public transport fares and road charges, encourage efficient behaviour. When fuel taxes rise, increased prices encourage motorists to acquire more fuel-efficient vehicles or switch to public transport. Funding transport facilities through general sales, income taxes or borrowing provides no incentive to be efficient or socially responsible; as such charges are completely unrelated to the cost imposed on the transport system or the benefits received.

Integrated transportation and urban development must occur at all geographic scales. At the micro level, much is to be gained from advancing the model of ‘complete streets’, an acknowledgement that streets serve numerous purposes, not just moving cars and trucks. The ‘complete streets’ movement,

gaining steam throughout Europe, much of North America and in parts of Eastern Asia, views road right of way as ‘public spaces’, managing and even slowing movements in favour of public transport, walking and cycling. One example is multi-way boulevards that provide spaces for cars, buses, pedestrians and sometimes even tramways – packaged with good designs that emphasize high-quality spaces and safety.<sup>5</sup> Non-motorized modes of transport such as walking and cycling, enliven a city, promote social interaction and allow a more physically active lifestyle. Some cities have gone one step further, reclaiming land once given over to motorways and freeways to pedestrians, cyclists and public transport. Seoul’s Cheng Gye Cheon freeway-to-greenway conversion, made possible in part by expanded BRT services to absorb lost roadway capacity, has not only reduced inner-city traffic congestion but has also been credited with spurring central-city redevelopment and urban infill. The 6-kilometre inner-city greenway laced with bike paths and urban art is today Seoul’s second most popular tourist destination.<sup>6</sup>

Progressive projects and programmes – such as green transport-oriented development and complete streets – do not suddenly appear, but rather begin with thoughtful plans and visions. Transport planning needs to be well integrated with land-use planning at all levels of government. Through both carrots (e.g. financial aid) and sticks (e.g. regulatory requirements), national governments are uniquely positioned to encourage state/provincial, regional and local institutions to link transport investment and urban development strategies in master plans, zoning practices and infrastructure design standards. Integrated transport and land-use planning development must also be emphasized in national urban development policies and plans. India’s national urban transport policy of 2006, for example, embraces integrated transport and land-use planning as its number-one priority. In fact, half the cost of preparing integrated transport and land-use plans in Indian cities is covered by the central government.<sup>7</sup>

### **Streamlining urban institutions and governance framework**

Innovative ideas and policies geared towards sustainable mobility require strong institutional and governance structures to oversee their successful implementation. Political will, sound leadership, transparency and accountability are essential in building public trust. Also vital to the entire process are the planning institutions, as these are capable of creating compelling visions of urban futures. Moreover, participatory mechanisms must be in place to ensure that planning and investment decisions are socially inclusive and representative of all segments of society. This implies giving non-state actors and city residents, such as neighbourhood associations,

a place at the negotiating table when making important urban mobility decisions. In strengthening institutions, it is essential that financial resources be channelled into training and capacity-building of the concerned personnel in order to empower them to take on the complex challenges of the urban transportation sector.

The development of a fully integrated and sustainable multi-modal urban transportation system requires a robust regional governance structure, which gives rise to inter-municipal cooperation. This fosters accountability and provides a territorial context for coordinating growth and services within a region's travel-shed. Regional institutions need to be endowed with the power of regulatory oversight and funding capacities to finance transportation investments and service management.

As noted above, while most of the innovations introduced in urban transport will come from local and regional actors, higher levels of government also have a crucial role to play. National urban transport policies that promote integrated planning and provide capital loans and technical assistance can help smaller cities chart a sustainable urban transport course.<sup>8</sup> Brazil has had a national urban transport policy for over 25 years, helping nurture sustainable transport practices in BRT-served cities such as Curitiba and Belo Horizonte. India's Ministry of Urban Development is today actively promoting transport-oriented development along planned and existing BRT corridors through financial support for forming unified metropolitan transport authorities.<sup>9</sup>

Technology itself can be an enabler of more grassroots and inclusive policy-making in urban transport. Social media, for example, allows like-minded individuals to coalesce and shape public discourse. In 2008, during a period when the TransMilenio BRT system in Bogotá, Colombia, was suffering from problems of extreme overcrowding and long queues at ticket offices, residents turned to social media to organize a large public protest. Active media coverage led to even louder public outcries, eventually prompting local leaders to introduce various capacity-expansion initiatives, including lengthening some of the key modular stations, expanding services and introducing more articulated buses.<sup>10</sup>

There is also a need to inject efficiencies, accountability and transparency into the urban transport decision-making process. This requires the development and institutionalization of planning processes and evaluation approaches that are based on objective measures of performance and tied to well-articulated goals and hoped-for outcomes. This promotes both transparency and accountability. At the same time, there is need for an open and democratic planning and decision-making process, in particular given the broad reach of the urban transport sector and its merits. This will not only bring the voices of all

citizens – women and men, children, the elderly, the disabled, businesses, governments, NGOs and civil society at large – to the table, but will also ensure that the needs of the least advantaged are clearly recognized and fully acted upon.

Responsibilities for the urban transport sector are being decentralized across the world, from Eastern Europe, to Sub-Saharan Africa and South-Eastern Asia. Human and financial resources are needed for the successful handover of functions and investment responsibilities from central to local governments. There is a need for metropolitan planning and operating authorities that reflect regions as 'ecological units' – i.e. by allowing planning and governance over a geographic territory that mimics commute-sheds, trade-sheds and air basins. Human resource development plans and integrated, viable and dependable urban transport funding programmes are also needed.

### Readjusting legal and regulatory instruments

The interventions highlighted above call for changes in the management of space, the built form, the engineering of transport, social behaviour, as well as in the institutional and financing arrangements related to urban development. These elements are built upon the legacy of a legal foundation that has perpetuated mobility systems which this report has found to be severely wanting. Any transformation would therefore entail major reform in the legal and regulatory framework relating to urban management. For example, the ordinances guiding the planning process have to be amended away from often applied segregation of use and rigid zoning towards fostering more mixed-use and compactness. The same applies to building codes and standards, mandates and authority allocated to different institutions, and also sanctions directed at reducing negative externalities.

While significant progress has been achieved in some cities, in terms of incorporating the necessary laws and regulation for realizing some of the above objectives, much remains to be done. The dire need for fostering inclusiveness and environmental protection not only calls for the enactment of a comprehensive set of statutes, but also requires the consolidation of enforcement capacity to ensure that the laws and regulations are abided by.

## CONCLUDING REMARKS

Urban sustainable mobility as a development issue cuts across the intersection of the most urgent challenges confronting the global community today. Neither the efforts towards reducing greenhouse gas emissions, nor the measures being taken to arrest the growing economic inequalities among and within nations, can be tackled without also addressing the

**A fully integrated and sustainable multi-modal urban transportation system requires a robust regional governance structure**

**While most of the innovations introduced in urban transport will come from local and regional actors, higher levels of government also have a crucial role to play**

**The interventions highlighted [in this report] call for changes in the management of space, the built form, the engineering of transport, social behaviour, . . . [and] in the institutional and financing arrangements related to urban development**

**Urban sustainable mobility . . . cuts across the intersection of the most urgent challenges confronting the global community today**

**It is possible to initiate and promote interventions that can effectively enhance the accessibility of cities today**

issue of sustainable mobility. Similarly, the quest towards eliminating poverty and fostering shared prosperity cannot succeed without also redressing the prevailing distortions in urban mobility systems and existing impediments on accessing the modern city.

This report has demonstrated that mobility systems contribute to the morphology of the city, both in terms of the spatial layout as well as in the configuration of its built form. In so far as these

two elements are related to the productivity and dynamism of the city in the broader setting, the impact of urban mobility is therefore local as well as macro. The report suggests that along the three key pillars of sustainable development – and within the foundations of robust, integrated and participatory institutions – it is possible to initiate and promote interventions that can effectively enhance the accessibility of cities today.

## NOTES

---

- 1 Economist, 2013.
- 2 See Chapter 8.
- 3 Beldean et al, 2007.
- 4 Shoup, 2011.
- 5 Jacobs et al, 2002.
- 6 Kang and Cervero, 2009.
- 7 Government of India, 2006.
- 8 Gakenheimer, 2011.
- 9 Cervero, 2013.
- 10 Parra, 2012.