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ISSUE PAPER ON TRANSPORT AND MOBILITY

KEY WORDS

Accessibility, land-use planning, Transit orientated Development, National Urban Policy, Freight, Inter-modal integration,

MAIN CONCEPTS

Sustainable Urban Mobility: The goal of all transportation is to create universal access to safe, clean and affordable transport for all that in turn may provide access to opportunities, services, goods and amenities. Accessibility and sustainable mobility is to do with the quality and efficiency of reaching destinations whose distances are reduced rather than the hardware associated with transport. Accordingly, sustainable urban mobility is determined by the degree to which the city as a whole is accessible to all its residents, including the poor, the elderly, the young, people with disabilities, women and children.

Non-motorised Transport: refers to the transportation of passengers through human or animal powered means. It includes, bicycles, rickshaws, pedicabs, animal drawn carts, push –carts and trolleys and walking.

Public Transport: Formal Public Transport services are those available to the public for payment, run on specified routes, to timetables with set fares and (for the purposes of this paper) in urban areas. They may be operated by public or private organisations and covers a wide range of modes like, bus, light rail (tramways, streetcars), metros, suburban rail, cable-cars and waterborne transport (e.g. ferries and boats)[1].

Compact cities' or 'smart growth" describe urban development that is compact, resource-efficient and less dependent on the use of private cars. The term 'smart growth' is most commonly used in North America, while in Europe and Australia the term 'compact city' is used more often to connote similar concepts. As an antidote to sprawl, these terms aim to reduce the municipal fiscal burden of accommodating new growth, while at the same time promoting walking and cycling, historical preservation, mixed-income housing that helps reduce social and class segregation and diversity of housing and mobility choices that appeal to a range of lifestyle preferences. Ten accepted principles that define such developments are: (1) mixed-land uses (2) compact building design (3) a range of housing

[1] Global Report on Human Settlements 2013 : Planning and Design for Sustainable Urban Mobility (GRHS 2013)

opportunities and choices as part of the mixed housing (4) walkable neighborhoods (5) distinctive, attractive communities with a strong sense of place (6) preservation of open space, farmland, natural beauty and critical environmental areas (7) development directed towards existing communities (8) a variety of transportation choices (9) development decisions that are predictable, fair and cost effective and (10) community and stakeholder collaboration in development decisions[2].

Transport Demand Management (TDM): Urban planning and design that has a strong relationship with travel demand management can be a cost-effective alternative to increasing capacity. A demand management approach to transport through better urban planning has the potential to deliver better environmental outcomes, improved public health, stronger communities, and more prosperous cities. TDM has to be part of the comprehensive strategy and complex set of technological measures and policies for the management of urban transport.

FIGURES AND KEY FACTS

Transport, in 2010, was responsible for approximately 23% of total energy-related CO_2 emissions. Greenhouse Gas Emissions from the transport sector have more than doubled since 1970 - increasing at a faster rate than any other energy end-use - to reach 7.0 Gt CO_{2eq} in 2010. The final energy consumption for transport reached 27.4 % of total end-use energy, of which a large share was urban. In a business as usual scenario, transport emissions could increase at a faster rate than emissions from other energy end-use sectors and reach about 12 Gt CO_2 a year by 2050[3]. This trend endangers the goal of limiting the increase in global temperatures to two degrees Celsius above pre-industrial levels. However, increasing mobility and connectivity in cities brings enormous benefits to society and also provides the essential means by which a city can function effectively.

Outdoor air pollution, which is partly caused by transport, was estimated to cause 3.7 million premature deaths worldwide in 2012; predominantly, 88% of these deaths were in low and middle-income countries[4]. Transport also contributes to soil and water pollution.

Traffic congestion, not only increases local air pollution but also causes heavy economic losses due to time and fuel wastage and increased emissions. For example, in the United States, time lost in traffic amounted to 0.7% of GDP, in the UK to 1.2 % of GDP, 3.4% in Dakar, Senegal; 4% in Manila,

[2] Bullard, 2007; Duany et al, 2000; http://www.smartgrowth.org/network.php, cited in GRHS 2013
[3] Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Chapter 8 , Transport)
[4] WHO 2014 (http://www.who.int/phe/health_topics/outdoorair/databases/faqs_air_pollution.pdf?ua=1)

Philippines, 3.3% to 5.3% in Beijing, China ; 1% to 6% in Bangkok, Thailand and up to 10% in Lima, Peru where people on average spend around four hours in daily travel[5].

Annually, 1.24 million people are killed in road traffic accidents which occur predominantly (92%) in low and middle income countries. Africa, which has only 2% of the world's vehicles and 12% of the population, has 16% of the fatalities[6].

The growth of motorisation is a worldwide phenomenon. In 2010 there were 1 billion motor vehicles worldwide (excluding two wheelers). Data from 2005 indicates that almost half of all trips in cities were made by private motorised modes. This proportion continues to increase. By 2035, the number of light duty motor vehicles (cars, sports utility vehicles, light trucks and minivans) are expected to reach 1.6 billion and by 2050 this number will exceed 2.1 billion. Most of the increase will be found in Asian Countries, especially China and India. Globally, the number of new cars sold annually increased from 39 million in the 1990s to 63 million in 2012. Some countries, notably in Asia and also in Africa, are seeing a huge increase of motorised two wheelers on their roads. Trends also indicate that private vehicle ownership grows slowly in countries with lower per-capita incomes, faster at middle income levels, reaching saturation at highest levels of income. For example, vehicle kilometers travelled per capita appears to have stabilized in a number of high income countries such as USA, Japan, Australia, UK, France and Germany.

Non-motorised transport made up about 37% of urban trips worldwide in 2005. For very short trips walking is the main mode of transport. In African cities it accounts for 30-35% of all trips.[7] Despite the high proportion of people relying on non-motorised transport, a divergence is seen between modal use, infrastructure allocation and modal funding in many cities. For example, in Dhaka, Bangladesh, almost 80% of trips are by walking, bus or informal motorised transport, yet 70% of road space is dedicated primarily to private vehicles. Similarly, in some East African cities, walking accounts for more than half of all trips but less than 1 percent of total costs, while accommodating private vehicles accounts for 50% of the total system costs.

The twenty-first century city is a city of intense flow of people, material and information. Goods transport accounts for 10 to 15 percent of vehicle equivalent kilometres travelled in urban areas and have been linked to the externalities of congestion and air and noise pollution. Evidence indicates that a high-income city in Europe generates about 300 to 400 truck trips per 1000 people per day and 30 to 50 tons of goods per person per year. Freight movement is largely driven by diesel powered cargo vessels, trucks, and trains and while diesel engines are more energy efficient as compared with petrol, they contribute significantly to GHGs and other short-lived climate pollutants particularly black carbon, impacting therefore also on public health. Despite the significance of goods transport in the urban environment, it has received relatively less attention from policy makers and planners.

[5] Climate Change 2014: ibid
[6] WHO Global Status Report on Road Safety 2013
[7] GRHS 2013 : ibid

ISSUE SUMMARY

While transport is an enabler of economic activity and social connectivity, a bias towards planning for individual motorised transport rather than accessibility has led to increasing passenger kilometers travelled per capita and a vicious cycle where in an effort to address congestion, the increasing numbers of private motorised vehicles are sought to be accommodated by building more and more roads and infrastructure such as flyovers, which in turn are soon overwhelmed by the rise in the numbers of vehicles. The objective should rather be to curb sprawl, create compact, walkable neighborhoods and reduce the vehicle kilometers travelled per capita. Urban form is a key determinant of transport systems and in turn is heavily influenced by transport systems. A compact city form enables people, particularly the poor to access jobs, educational and health services more easily, reduces fuel consumption and provides more opportunities for social interaction. Figure 1 below illustrates the relationship between urban density and energy consumption.

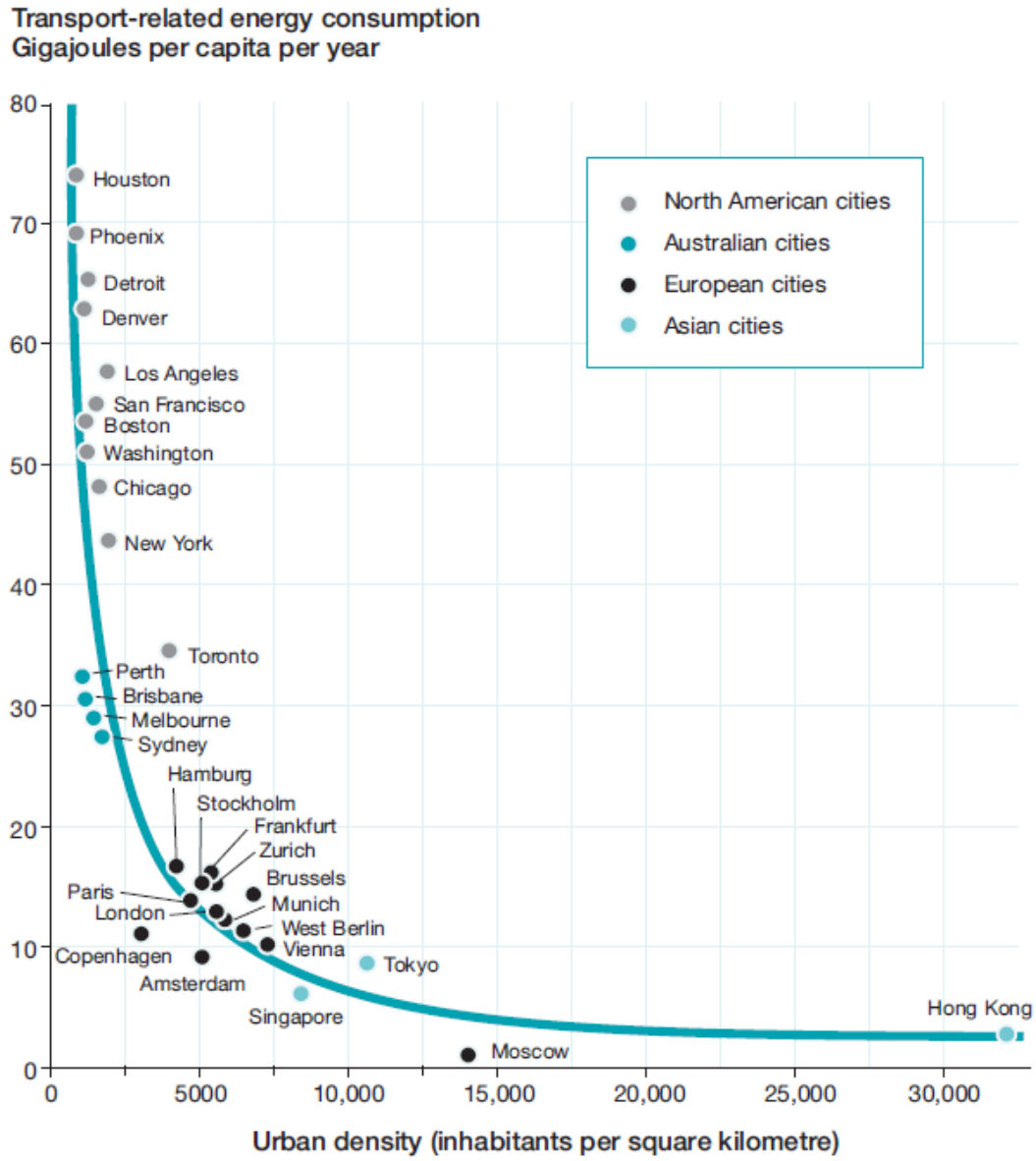

Figure 1 : Influence of urban densities on transport related energy consumption in 32 cities (1989)

(Source : Newman and Kenworthy 1989 cited in lefevere 2009/ GRHS 2013)

In many developing countries, over the past few decades, formal public transport has deteriorated, as governments held down fare levels without increasing subsidies. This led to the decline in the quality of services. In many countries in Africa, informal transport now dominates service provision. The informal sector is characterised by individual entrepreneurs operating minibuses, midi buses, shared taxis and, in some countries, motorcycle taxis. The 'matatu' minibuses and midi-buses in Nairobi are reported to have the highest per capita use of informal transport in the world with 662 trips per inhabitant per year, three quarters of public transport trips and 36% of traffic volumes.

Women and men in urban areas have different travel patterns. Women tend to make more trips, but over shorter distances. Issues related to sexual harassment, safety and security have arisen with regard to women taking public transport or walking. High costs for public transport can make it prohibitive for women. A study in Kampala, Uganda shows that women spend as much as 29% of their income on public transport. A number of challenges also confront people with disabilities.

KEY DRIVERS FOR ACTION

Focus on Demand

A reversal of the paradigm, where people rather than vehicles are at the centre of planning, is necessary. This paradigm takes a rights-based approach and considers accessibility as the ultimate objective of all transportation; i.e. physical access to places and opportunities, to jobs and services and to goods and amenities. The focus in the new paradigm shifts from managing the "supply" side of mobility to managing the "demand side". By promoting mixed-land use planning and more compact cities, trip-lengths can be shortened and transport activity reduced. However, even with the focus on accessibility as the goal, the means of transport, remains a vital element. The "Avoid-Shift-Improve framework[8] promotes a demand based approach with the objective of reducing emissions and congestion and making cities more livable. "Avoid" stresses better land use planning and travel demand management, reducing trip lengths. "Shift" refers to the move to more sustainable means of transport – non-motorised transport and public transport and finally "Improve" looks at vehicle and fuel efficiency. A sustainable urban transport system builds on an efficient modal structure consisting of walking, cycling and public transport. Better design of streets and public spaces, and Transit Oriented Design can not only meet the accessibility needs of people but also contribute to the urban economy.

Enabling Policy Environment and Institutional Coordination

An integrated approach to land use and transport planning is essential. Such integration needs to be promoted at the highest level through national urban policies and National Urban Transport Policies which are developed as statutory instruments that provide a vision for sustainable urban development while also defining the roles, responsibilities and relationships amongst different sectors, agencies and stakeholders, guiding action across regional, metropolitan and neighbourhood levels. Such policy guidelines can also encourage the development of "Sustainable Urban Mobility Plans" as an innovative, integrated and inclusive transport and land use planning processes which are being applied in a number of cities worldwide.

A related dimension is the amalgamation of institutional responsibilities under one agency which has jurisdiction over transport, land-use and investment planning, road construction and maintenance, traffic

[8] www.transport2020.org/file/asi-factsheet-eng.pdf

management, licensing, enforcement and operations. This is particularly relevant for large metropolitan cities. Such policies can also support a regional vision for coordinated land-use and transport (e.g. service integration of public transport in a metropolitan region). Some good examples indicate the way forward. In Stockholm, Sweden, to deal with urban growth, the Storstockholms Lokaltrafic was created as a single regional transport body to take over the responsibilities that had been earlier shared amongst different municipalities[9]. In another example, encouraged by potential investments in transport infrastructure, the five "county governments" that make up the Greater Nairobi Metropolitan Area have agreed on a collaborative framework for transport planning and operations by signing a "Memorandum of Understanding" as a precursor to the establishment of the proposed "Nairobi Metropolitan Transport Authority" to oversee transport development in the Greater Nairobi Metropolitan Area.

Intermodal integration and Transit Orientated Development

Modal integration of public transport with non-motorised transport increases the reach and accessibility of public transport. It is important to consider the complementary roles of freeways and railway systems. For example in the suburbs of Munich, Germany, motorways and suburban trains are physically integrated to allow for motorists to switch to trains. Similarly, better pedestrian and cycling paths feeding into suburban railway stations, bike sharing and rental schemes where such stations function as a node can improve accessibility in the wider metropolitan regions and should be prioritised in large urban agglomerations.

Curitiba, Brazil provides a good example of Transit Oriented Development, where a lower cost option bus rapid transport system was introduced in conjunction with a land-use policy that promoted increasing intensity of land-use progressively with proximity to the BRT corridor demonstrating a planning for people approach.

Good examples of modal integration have emerged in Asian and Latin American Cities as well. In Guangzhou, China, the BRT system which serves 800,000 passengers daily is integrated with the city's bicycle lanes and bike share systems, thereby ensuring access to public transport and extending the reach of public transport. Sao Paolo and Curitiba in Brazil, Bogota in Colombia and Santiago in Chile have also taken measures towards such integration.

Urban Freight Management

With growing urban congestion crippling many cities and draining the economy, the concept of "green freight" has emerged in recent years. It involves policy makers, business leaders and civil society working voluntarily together to improve the energy and environmental efficiency of freight movement. This approach reduces costs and can make businesses more competitive, while also reducing emissions and benefiting public health. Transport strategies in the increasingly contested urban landscape have not received adequate attention and it is essential that the close interactions between urban land-use and

[9] GRHS 2013 : ibid

goods transport is considered in framing policies and strategies that can ensure the economic benefits of efficient goods transport while reducing its environmental, health and social impacts.

Some good practices have emerged on freight distribution in urban areas. These include rationalization of delivery and consideration of "reverse logistics" (i.e. removal of waste and modal adaptation), but much more focused research is required on integrating freight distribution as an integral part of sustainable urban mobility. Challenges of (transfer) terminals and logistics centres might be reduced, if they move away from road dependency and towards intermodal terminals with rail access. Freight logistics and intermodal options require more attention from policy and decision makers; especially regarding decision making for terminal location and integration.

Financing

Policies need to be promoted that make car travel less appealing while facilitating a modal shift towards public transport and NMT. Financial incentives and integrated tariff systems can be provided to ensure convenience, affordability and uptake of these alternative modes. In addition, based on the "polluter pays principle, policies on parking, congestion charging or tolling can reduce private automobiles use and promote the use of public transport and NMT. The additional revenues generated from road/congestion pricing measures can be used as a source for financing investments in public transport improvements. Innovations such as car-sharing can reduce car ownership, but still represent a win-win situation for the car industry and cities, serving to meet the un-met demand for mobility amongst city residents, while reducing demands on parking space. Employers can also contribute to reducing congestion by incentivising car-pooling amongst employees.

Financial sustainability of transportation systems is key to ensure sustainable mobility. With growing urbanization and increasing travel, it is necessary that appropriate levels of financing are available. Solid financing mechanisms for sustainable transport – mobility funds/programs, sustained and higher budgetary allocations according to priorities defined in National Urban Transport Policies and Sustainable Urban Mobility Plans ensuring the realization of identified measures are required. Broadly, experience indicates that operating costs for public transport should be linked to fares, but capital costs should be supported by broader sources of revenues. The New York Metropolitan Transportation Authority (MTA) provides an example where a single agency is able to consolidate revenues from different sources for providing a multi-modal regional transport system. The agency combines revenues from federal, state, local governments and earmarked transportation taxes as well as from tolls from roads and bridges. This allows for the easy distribution of costs and revenues across different modes –illustrating a potentially easily used policy tool.[10]

Public Private Partnerships and Value Sharing models also have great potential in bridging the financing gap for investments in public transport. To illustrate in Hong Kong, the Government makes land around future stations available to Mass Transit Railway Corporation (MTRC) on long-term lease at pre-transport

[10] GRHS : ibid

development prices. The MRTC then sells the rights to develop these sites – at post development prices - to private developers who create shopping malls and houses. The difference between the prices pays for the capital cost of the transport infrastructure.

Use of ICTs

Modern communication and ticketing technology has the potential to greatly facilitate integration of different modes of transport. Reliable demand modelling and forecasting data should be the basis of any transport intervention. Good examples based on diffusion of ICT are emerging in this area. For instance, the absence of origin-destination data in East African cities made it difficult to plan BRT operations. But by using information on informal transit routes captured on smart phones, it was possible to map the mobility patterns of people using informal public transport. Since BRT services are expected to reflect current informal transit patterns, this data was used for operational plans for the BRT systems. Such innovative use of technologies and instruments can be strengthened and facilitated to improve accessibility and reduce accidents, pollution and GHG emissions. Application of ICT and Intelligent Transport Systems (ITS) also play a key role to increase the operational efficiency of urban transport and improve services to the benefit of users of sustainable transport (e.g. public transport acceleration, traffic control centres and adaptive traffic management, E-Ticketing, integrated information, real-time-data, multimodal mobility applications and navigation) – enormous potential for innovation.
Knowledge of successfully implemented urban mobility solutions can be shared amongst local and national governments to boost the uptake of these strategies. Knowledge also needs to be expanded on how the new paradigm can be implemented in practice. This calls for engagement of cities, civil society, industry and financial institutions in collaborative and operational partnerships in the form of projects and concurrently for capacity building on operation and maintenance aspects. National Urban Policies together with National Urban Transport Policies articulated with the new paradigm of accessibility can provide guidance through sample legislation, e.g. on compact city planning and incentives for clean transport.

Some of the other key drivers for action for sustainable urban transport may also include (i) Formulation of coherent National Urban Transport Policies for consolidating overarching policy goals with action on local levels, including legal frameworks for sustainable transport governance, funding programs and strong cooperation of national, provincial and local authorities (ii) Innovative, integrated and inclusive transport and land use planning processes (iii) Human and institutional capacity-building to enable policy-makers and planners to implement policies and successfully realise measures on urban transport and (iv) Strengthening of international cooperation on sustainable transport to improve the access to technologies, experiences and concrete solutions as well as to ensure mutual learning and improvement of solutions.

PLATFORMS AND PROJECTS

- The Urban Electric Mobility Vehicles Initiative (UEMI) (http://unhabitat.org/action-platform-on-urban-electric-mobility-initiative-uemi/) launched at the UN Climate Summit on 23 September

2014 with the goal of reducing emissions from transport while simultaneously improving access and mobility through the widespread uptake of Electric Vehicles, such that EVs make up 30% of total urban travel by 2030. The initiative will be implemented in the overall context of a transition to cleaner sources of energy and better urban planning and calls for complementary actions by "supply" and "demand" side actors such as Industry and cities respectively. International organisations including UN-Habitat, other UN agencies, the International Energy Agency, other knowledge and research organisations and the UN Global Compact will play a facilitating role through knowledge sharing, capacity building and support through demonstration initiatives.

- The Partnership on Sustainable Low Carbon Transport (SloCaT) (www.slocat.net)
- Bridging the Gap – a multistakeholder partnership to promote sustainable transport in the international climate debate (www.transport2020.org)
- ICLEI's EcoMobility Initiative (http://www.ecomobility.org/)
- The HUB, a capacity-building platform by Embarq India/WRI

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