SUSTAINABLE URBAN DEVELOPMENT – THE CHALLENGES 21ST CENTURY CITIES FACE

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ABSTRACT

This paper presents the 21st century challenges towards a sustainable urban development, particularly in the developing and transitional cities. Sustainable development is however a complex concept that is subject to numerous interpretations since it involves several disciplines and possible interconnections. It is however generally agreed that a sustainability favors conditions that benefits the environment, the economy and society without compromising the welfare of future generations. The basic definition of sustainability has been expanded to include three major pillars (often referred as the three E's)-social equity, economic efficiency and environment responsibilities. To this end, sustainable urban planning must take place within an understanding of the factors shaping cities, the major challenges, among others, include are environmental, demographic, economic, socio-spatial and institutional. Urban development, in a broader sense, encompass three areas-urban land use, urban civic services, and infrastructures. Among them, transport infrastructure, in particular, providing access to meet basic needs of human being, acts as an important catalyst towards a sustainable urban development. Transport-land use links are another pillar towards sustainable urban development. Spatial forms of urban planning linked to infrastructure can promote more compact form of urbanization focused around public transport. In this paper, author emphasizes that how sustainable transport can promote sustainable development. Sustainable transport is the capacity to support the mobility needs of a society in a manner that is the least damageable to the environment and does not impair the mobility needs of future generations. Sustainable development applied to transport system requires the promotions of linkages between environmental protection, economic efficiency and social progress. Under the environmental dimension, the objective consists in understanding the reciprocal influences of the physical environment and the practices of the industry and that environmental issues are addressed by all aspects of the transport industry. Under the economic dimension, the objective consists of orienting progress in the sense of economic efficiency. Transport must be cost effective and capable of adapting to changing demands. Under the social dimension, the objective consists of upgrading the standards of living and quality of life. In this paper, it will be outlined how to address these challenges and issues infuse in planning system on the way to sustainable development.

Key Words:Sustainable Development, Sustainable Transport, Equity, Efficiency, Climate Change, Demographic, Socio-Spatial.

Introduction

The globe as a whole is undergoing in an unprecedented urbanization trend, especially in the developing countries, this trend is significant. The growth of urban population and area is phenomenal. In developing countries, the urban population is increasing due to natural growth and rural to urban migration. According to UN-Habitat Global Report on Human Settlements, between 2007 and 2025, the annual urban population increase in developing regions is expected to increase in a pace of 2.27 percent rate compared to a mere 0.49 percent rate in developing regions. As a result, the key problems facing the urban governments to cope with the challenges poses by the increasing urban population and areas. Due to increased urban population and urban areas in developing countries is increasingly facing the effects of phenomena such as climate change, resource depletion, food insecurity, informal settlements and economic instability due to unemployment. Urban governments/institutions need to facilitated the provision of urban infrastructure in terms of ability of urban residents to pay for such services and in terms of resilience to natural disaster. From these backdrop, all the issues that will significantly reshape urban forms and all of them need to confront cogently to be urban area sustainable and livable, i.e. environmentally safe, economically productive, and socially inclusive.

As population grows the urbanization of society is inevitable. Urbanization leads to an increased impact on the environment; the ecological footprint of cities is spreading. The impact of growth on all areas of society must be acknowledged. Sustainable growth requires an evolution in the way urban areas carry out their activities such as resource use and the movement of people and goods. The physical infrastructure in addition to social and economic process must evolve to acknowledge the challenge of growth.

To attain sustainable urban development, the role of urban land use planning and transport planning is indispensable. Sustainable urban land use planning, sustainable transport system and strong integration between the two, plays the key role to shape the urban form to promote sustainable urban development. In this paper, the sustainable urban development challenges are described in section 3. Under section 4, it has been set forth the goals of sustainable development. In section 5 and 6, both the underlying issues towards the way of sustainable development has been delineated. At the ends of the paper, under sections 7 and 8, presented examples of sustainable urban development venture and underscores the needs to attain sustainable development goals.

What is Sustainable Urban Development?

Overall Concepts of Sustainable Development

Sustainable urban development is a new paradigm aimed at harnessing urbanization for socio-economic growth and poverty reduction. The key concept for successful urban development is the realization by governments and urban development managers that cities are not avoidable burdens. If well managed, they are desirable assets to economic growth, and governments must plan and act in the interests of their communities. However, sustainable urban development implies a process by which sustainability can be attained, emphasizing improvement, progress and positive change, incorporating both environmental and social dimension.

Sustainability concept first embrace global political attention with the publication of the Brundtland Report, entitled *Our Common Future* (1987). The report defines sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs." By 1992, the concept of sustainable development had gained further political credibility when the United Nations convened the Conference on Environment and Development (also known as the Earth Summit) in Rio de Janeiro, Brazil, organized around the principal themes of environment and sustainable development. Sustainability, however, grew beyond environmental concerns during the 1990s, to include environmental, economic and social (or equity) dimensions or the so- called "three E's of sustainability" Inclusion of the political, institutional and governance dimension into the concept emerged later but, until recently, with much less prominence.

Concepts of Policy Frameworks Towards Sustainable Urban Development

The concept of sustainable urban development was first introduced into urban land use planning through *Agenda 21*. It was further operationalized through an initiative on *Localizing Agenda 21* (LA21), developed by UN- HABITAT in 1992 following the Earth Summit. More recently, the World Bank launched its Urban and Local Government Strategy, which advocates a new paradigm aimed at harnessing urbanization for growth and poverty reduction. It states that the central role for successful urban development is the acknowledgements by governments that cities are the engine of economic growth. If well harnessed, urban centers are key contributor to economic growth, and governments must plan and act in the interests of their communities. These concepts unfold along five business lines considered critical for cities and local governments in the decade ahead, namely:

- City management, finance and governance (focusing on the core elements of the city system);
- Urban poverty and slums (making pro-poor policies a priority in cities);
- Cities and economic growth (enabling urban economic growth);
- Urban planning, land and housing (encouraging progressive land and housing markets); and
- Urban environment, climate change and disaster management (promoting a safe and sustainable urban environment).

Over and above these agency-driven programs, a number of other areas in urban land use planning are also significant to the sustainability of cities. The most important include the following:

- Addressing the problem of climate change and reducing the carbon footprint of cities;
- Incorporating efforts to integrate the "green" and "brown" agendas;
- Effectively linking urban land use planning, urban development and infrastructure planning; and
- Undertaking planning in peri-urban areas and at the regional level, particularly in the case of regional metropolitan areas and megacities.

Sustainable Urban Development Challenges

The challenges in hand and lie ahead to foster sustainable urban development are categorized in demographic, environmental, economic, social-spatial and institutional challenges. It also needs to recognize the changing institutional structure of cities and the emerging spatial configurations of large, multiple-nuclei or polycentric, city-regions. The challenges are described in the next few subsections.

Demographic Challenges

The phenomenal growth witnessed globally over the last three decades-which is presenting urban planning and management in the face of challenges. In 2008, for the first time in history, over half of the world's population lived in urban areas and, according to current projection, this will have risen to 70% by 2050. Almost all of this growth will take place in developing regions. Between 2007 and 2025, the annual urban population increase in developing countries is expected to be 53 million (or 2.27%) compared to a mere 3 million (or 0.49%), in developed countries.

A key problem is that most of the rapid urban growth is taking place in countries least able to cope-in terms of the ability of government to provide, or facilitate the provision of urban infrastructure; in terms of the ability of urban residents to pay for such services; and in terms of resilience to natural disasters.

The inevitable results have been the rapid growth of urban slums and squatter settlements. Increase the urban areas in peri-urban areas where the low income people are forced to live there to avoid the higher living costs in core urban areas-where it is absence

of urban facilities e.g. water supply, sewerage line, electricity, etc. and they are more exposed to natural disasters e.g. floods, landslides, social-security, natural disasters, etc. As per UN-Habitat statistics 32% population live in slums in inequitable and life-threatening conditions, and are directly affected by both environmental disasters and social crises, whose frequent and impacts have increased significantly during the last few decades.

This rapid urbanization should be control or redirected through sustainable urban policy. There are numerous policies and planning tools to address the demographic challenges, as it can be evident that population shrinkages in some in parts of the developed world, as in the case of some parts of Japan, the US and Europe, as well as in selected developing countries.

Environmental Challenges

One of the most significant environmental challenge at present is climate change. It is predicted that, within cites, climate change will negatively affect access to water and that hundreds of millions of people will be vulnerable to coastal flooding and related natural disasters as global warming increases. The major concern is the environmental impact of fossil fuel use in urban areas, especially of oil, and its likely long term increase in cost. The global use of oil as an energy source has both promoted and permitted urbanization, and its easy availability has allowed the emergence of low density and sprawling urban forms-suburbia-dependent on private cars. Beyond this, however, the entire global economy rests on the possibility of moving both people and goods quickly, cheaply and over long distances. Vehicle emissions are linked to Greenhouse Gas Emissions (GHG) and hence global warming. Urban transport accounts for about 14% of human generated GHG emissions. These emissions contribute substantially to global climate change. The source of environment pollution and climate change due to rapid urbanization are:

- use fossil fuels in urban transport;
- urban industrial waste discharge without treatment;
- Car dependent urban forms instead of sustainable transport mode;
- urban household waste pollution;
- urban air and noise pollution;
- horizontal expansion of urban area, occupying the green field instead of brown field development, etc.

All of these negative externalities can be escape or minimize through sustainable urban development endeavors– in terms of urban land use and urban transport and effective coordination between them. Sustainable transport planning is presented next sections.

Economic Challenges

Urban centers are the power house of economic activities. Globally, urban centers have significant contribution to national economy and create enormous employment opportunities as well as informal sector development-and all of these have explicit impact on national economy. In fact, world economy rests on the movement of people and goods, efficiently and quickly, from one place to another. Urban development in terms of efficient urban transport can play such due role to have the economic activities in place. If people and goods movements are inhibiting by the poor urban transport systems, then it badly impacts the national economy. For example, in Dhaka, the traffic congestion eats up 3.2 million working hours every day-with millions of dollar economic loss, adversely impact the national economy.

On the other hand, urban settlements have been the impact on urban labor markets-growing income equality-caused by growth in the service sector and decline in manufacturing. Urban labor markets have been rapid growth of the urban informal economy in all regions of the world, but particularly in development countries. Informal sector job account for more than 40% of all employment in Asian regions. Among the most consequential challenge that urban planning has to address in the next decades, especially in developing countries, are increasing poverty and inequality, as well as to the rapidly expanding urban informal sector.

Socio-Spatial Challenges

In developing countries, rural poor people migrates to cities in search of jobs with the hope for more incomes. Cities has more formal and informal job opportunities and ironically, it is true that with the same status of work, it is paid more in urban than rural. Therefore, the spatial forms of cities urban areas are largely driven by the efforts of low income households to secure land that is affordable and in a location close to employment and other livelihood sources. This process is leading to entirely new urban forms as the country side itself begins to urbanize. The bulk of rapid urban growth in developing countries is, in fact, now taking place in unplanned peri-urban areas, as poor urban dweller took for a foothold in the cities and towns in locations where land is cheap and more easily available, whereby they can escape the high costs and strict urban land regulations, and where there is a possibility of consisting urban and rural livelihoods. Sometimes, there poor migrant people start to live in a group by building makeshift temporary sheds inside the urban centers in a pocket area or in a government unused lands. Over the time these squatter's area become the den of unlawful activities and narcotics.

Moreover, cities with increasing difference between high and low income areas are common in developing countries, with at one extreme, high income gated communities being developed and, at the other extreme, enclaves of poverty and ethnic communities emerging. An additional phenomenon in the developing countries cities is the expansion of the informal communities, both within the cities and on the urban periphery, lacking the most basic civic infrastructure and vulnerable to natural calamities.

To overcome these challenges, urban authority need to adopt innovative approaches - use of spatial planning to integrate public-sector functions, new land regulations and management approaches; participatory process and partnership at the neighbor levels and planning for new and more sustainable spatial forms such as compact cities and new urbanism. Older forms of urban planning have failed to accommodate the ways of life of the majority of inhabitants in rapidly growing and largely poor and informal cities, and has often directly contributed to social and spatial marginalization.

Institutional Challenges

The processes of formation of cities or urban area are long back history, some cities and urban area gradually formed by sums of individual initiatives and some are by proactive planning ways, and some are by mix of both. Urban area management and planning tasks are rest upon the local government, usually being the most responsible tier. The most common features are that multilateral institutions are engaged in urban planning and management level. As a result, the most obvious backdrop is the lack of coordination among the institutions heading towards a sustainable urban development. Another important building block is the "good governance". For example, in Dhaka, the intuitional problems in practice are-so many organizations are engaged in urban development with little or no coordination either vertically or horizontally, serious deficiency of compliance due to lack of hierarchy or chain of command among the institutions. Furthermore, there is insufficient evaluation and monitoring due to lack of manpower. In addition to that, there is a short of expertize equipped with contemporary urban planning concept, because academic curriculum is not regularly updated with time befitting ideas.

To overcome these challenges, government should take initiatives, like, decentralizing the responsibilities and resources to local authorities, encouraging the participation of civil societies; using partnership sharing the risks among stakeholders to achieve common objective, etc. Generally, urban planning is highly reliant on the existence of stable, effective and accountable local government, as well as a strong civil society.

Goals of Sustainable Urban Development

The Global Report on Human Settlements (UN- HABITAT, 2009) offers the following environmental, economic and social goals of sustainable urban development. Some advocate including institutional dimensions in sustainability so that the role and capacity of governance, institutions and decision making affecting subsequent resourcing practices of sustainable urban development are addressed.

Environmental Dimensions:

- Reducing greenhouse gas emissions and implementing serious climate change mitigation and adaptation actions
- Minimizing urban sprawl and developing more compact towns and cities served by public transport
- Sensibly using and conserving non- renewable resources
- Reducing energy use and waste produced per unit of output or consumption
- Recycling or disposing of waste produced in ways that do not damage the wider environment
- Reducing the ecological footprint of towns and cities

Economic Dimensions:

- Reliable infrastructure and services, including for water supply, waste management, transport and communications, and energy supply
- Affordable access to land or premises in appropriate locations with secure tenure
- Financial institutions and markets capable of mobilizing investment and credit
- A healthy educated workforce with appropriate skills
- An enforceable legal system that ensures competition, accountability and property rights
- Appropriate and adequately resourced regulatory frameworks which define and enforce non- disciplinary, locally appropriate minimum standards for the provision of safe and healthy workplaces and the treatment and handling of waste emissions

Social Dimensions:

- Promoting equal access to, and fair and equitable provision of, services
- Advancing social integration by prohibiting discrimination and offering opportunities and physical space to encourage positive interactions
- Assuring gender and disability sensitive planning and management
- Preventing, reducing and eliminating violence and crime, including its causes

Institutional Dimensions:

- Political will and support in the delivery of sustainable visions
- Transparent administrative structures and processes
- Adequate and sustained institutional capacities
- Appropriate supporting legal frameworks
- Sustained stakeholder involvement

- Adequate sustained coordination between concerned government bodies, and among government bodies, community groups and private sector stakeholders
- Relevant and effective regulations for the sustained management and revenue generation of urban development services

Role of Land Use Planning Towards Sustainable Development

Urban land use planning is one sub- sector of sustainable urban development. Before we talk about the role of urban land use planning, in this section it will be discussed the role of urban land use planning and its emerging urban planning issues that improve traditional planning practices and support integrated and sustainable urban development.

New Approaches to Urban Planning that Support Sustainable Development

Translating the goals of sustainable development into the urban sector is complex, particularly when compared to the more straightforward urban planning practices of "predict and provide", which has characterized traditional planning practices in the past. The complexity and interdependence of the issues and challenges related to sustainable development can only, however, be effectively addressed if a strategic framework for sustainable development is employed in urban planning.

Such a strategic framework would include the multiple concerns and demands of social cohesion and equity, gender equality, crime, safety, health, heritage and, of course, the environment. This would result in the imperative use of cross-sector programs and multi-criteria methods of analysis and appraisal for making the most effective decisions. This plethora of demands also poses institutional challenges as this approach often confronts obstacles related to silo thinking by powerful sectors/agencies, given the cross-sectoral programs pursued and the sharing of budgets.

Integrating cross-sectoral policy objectives into physical planning objectives presents a complexity of trade-offs between non-physical and physical entities, which master planning does not encounter. This broader approach, furthermore, requires a far more complex kind of dialogue than that required by traditional practices. Despite this, new and clear common elements to urban planning exist, which are emerging and improving urban planning practices. These elements include an appreciation that urban planning needs to become more:

- Strategic rather than comprehensive;
- Flexible rather than end-state orientated;
- Action and implementation orientated through links to common budgets, programs and projects and city-wide/regional-wide infrastructure;
- Stakeholder and community driven rather than expert driven;
- Sensitive to political time scales;
- Reflective of emerging concerns, such as global competitiveness, environmental risks, new visions and problems of local identity and sustainability;
- Active in providing an integrative role in policy formulation and urban management; and
- Focused on a planning process that has outcomes, which are highly diverse and dependent upon stakeholder influence or local policy directions.

Why is Land Use Planning Important?

Urban land use planning, as one important component of urban planning, can contribute significantly in addressing the major urban challenges discussed above in section 3, if led by well-informed policies based on sustainable development principles and supported by well thought out and managed follow-up actions and investments.

Urban land use planning, i.e., the planning of land in built up areas that denote spatial differences and similarities in certain types of usage, is premised on the belief that areas within towns and cities have land use functions (or mixes of them) that can be managed and planned with varying degrees of success. This planning function is typically undertaken by city authorities who apply enablement and intervention measures targeted at different types of activities the land areas accommodate, attract and generate. The emerging urban planning issues that will address the (a) energy consumption and GHG emissions; (b) disaster mitigation and adaption; (c) public health; (d) per unit infrastructure cost; (e) economic productivity; (f) food supply; (g) poverty prevention communities; (h) human time savings; and; (i) cultural values.

(a) energy consumption and GHG emissions: urban form is important factor in reducing urban energy consumption, particularly through density and transportation efficiencies. For example, high- density neighborhoods with good accessibility enable the construction of energy- efficient, highly livable, high- rise neighborhoods. This urban form also reduces emissions of greenhouse gas and other pollutants, which are highly correlated with automobile use and travel distances.

(b) disaster mitigation: vulnerability can be reduced by incorporating disaster mitigation measures into land use planning, for example by identifying potential natural hazard areas; channeling growth away from high disaster risk areas, i.e., earthquake faults, coastlines subject to sea level rise and areas subject to mudslides; and introducing new building codes and materials specifications

(c) public health: Poorly planned and managed peri- urban areas may be breeding grounds for epidemics (e.g., influenza, avian flu, SARS). • On the other hand, well- functioning urban systems can improve the quality of air and water bodies, and enable people and emergency vehicles to easily access health care facilities.

(d) Infrastructure costs per housing or work unit served are much lower if land is used efficiently. Benefits are associated both with density and degree of contiguity of the built up area (e.g., minimizing leapfrogging and maximizing nodality).

(e) economic productivity: Economic productivity can be facilitated through cluster development (localization, agglomeration economies), innovation (face- to- face) and logistics processes.

(f) food supply: Over consumption of land often implies destruction of the natural environment and a decrease in agricultural production. Thus, local, national and global food supplies can be protected through minimizing unnecessary loss of fertile land. Module 4 will further discuss this issue.

(g) poverty prevention in community: Spatially efficient cities can deliver housing that is both affordable and accessible to employment, schooling and places of leisure. For example, high- density development clustered around transit stations enables lower cost housing (land costs per unit are lower) and accessibility. This is especially important to the poor, who are often recent migrants. Effective land use management ensures security and social mixing as benefits to the urban poor, especially woman and children, who are otherwise often isolated.

(h) human time savings: human time savings can be achieved through more efficient land use and urban form (for example, high density and mixed land use planning enable a closer fit between workplace and residence – require a short trip, reducing congestion, etc.).

(i) cultural values: land use planning can contribute to the preservation of local culture through maintaining the cultural landscape. Moreover, it can be an important tool in enhancing cultural development through providing the space for cultural exchange, such as vibrant city centers, citizen art centers, etc.

Role of Urban Transport towards Sustainable Urban Development

Transport shapes urban development by enhancing accessibility, attributes to land, such as residential and job densities and the degree of land-use mixing, affect travel demand. Sustainable urban development will never be appearing if the transport system is not sustainable. With the pace of rapid urbanization, increasing energy consumption, extensive travel demand and poor natural resources management must be redirected. Urban area expansion in horizontally creates to commute longer distance must be curbed.

Transportation is the core component supporting to attain the sustainable urban development. "*Sustainable transportation is the capacity to support the mobility needs of a society in a manner that is the least damageable to the environment and does not impair the mobility needs of future generations*".

Sustainable development applied to transport system requires the promotions of linkages between **environmental protection, economic efficiency and social progress**. Under the environmental dimension, the objective consists of reducing the GHG emissions. Under the economic dimension, the objective consists of orienting progress in the sense of economic efficiency. Transport must be cost effective and capable of adapting to changing demands. Under the social dimension, the objective consists of upgrading the standards of living and quality of life.

Automobile dependence is a situation that is often related to an unsustainable urban environment. According to WHO statistics, transport account for approximately 14 percent GHG emission. This contributes significantly climate change. Therefore, spatial urban forms as described in subsection 5.2 can eventually reduce the need for long distance trip. Introduction of sustainable mode of urban public transport like MRT and BRT can meet the transport demand in an affordable way towards environmental sustainable way. Urban government must take policy to discourage personal vehicle usage and to encourage or promote mass transits. Demand responsive mass transit has the more leverage to cater the increasing demand with the pace of urbanization.

Rapid urbanization and rising income levels, both fueled to increase the motorization in urban areas. Besides that, sprawling urban land use also fueled to car dependency. These will eventually keep pressure on to import fuel using forex reserve. Well integrated transit and land development create urban forms and spaces that reduce the need for travel by private motorized vehicles. Area with good access to public transit and well-designed urban spaces that are walkable and bikeable become highly attractive places for people to live, work, learn, play and interact. Such environments enhance a city's economic competiveness, reduce local pollution and GHG emissions and promote inclusive development.

Examples of Ongoing Urban Trends

In this paper, it is presented two phenomenal *examples* the developing cities facing due to increasing urbanisation. One is urban sprawl with reducing the agricultural land and other is the urban transport infrastructure focusing the car movement, not for people. This trends should be reverted to achieve the sustainable development goals.

Expanding cities – shrinkages green spaces: cities in developing countries are growing at an unprecedented rate. Over the next several decades, most of the world's urban population growth is projected to take place in developing countries. Urban population growth and spatial expansion are expected to accelerate in the coming years, as migration from the rural to urban continues. Urban centers have always attracted people from rural seeking employment opportunities, better living, healthcare, and educational facilities. At the same time, fast-growing cities create jobs that further accelerate their economic growth. Urbanization then further intensifies, as people and growth spill out from urban boundaries.

To overcome this challenge, government can impose some regulatory measures:

- Emphasize brown field development, instead green field development;
- Encourage high density and mixed land use development;
- Green belt along the urban periphery to inhibit the urban sprawl; etc.

Cities for Car, not for People: One of the most critical challenges facing cities worldwide is automobile-dependent urban development. With economic growth, many cities in developing countries have begun to follow the trajectory of motorization that developed countries once followed—but at a much faster rate. Worldwide, rising incomes are fueling automobile ownership, spurred by increasingly affordable vehicles. Many urban inhabitants—often the middle-income population-are shifting from public or nonmotorized transportation to private automobiles. In addition, higher incomes allow people to afford more spacious houses on large suburban lots, using their own cars to reach jobs and educational opportunities in the city. An automobile-oriented built form—marked by spread-out development, noncontiguous land uses, large city blocks that are unfriendly for pedestrians, and strip development—is an inevitable consequence of an automobile-dependent lifestyle.
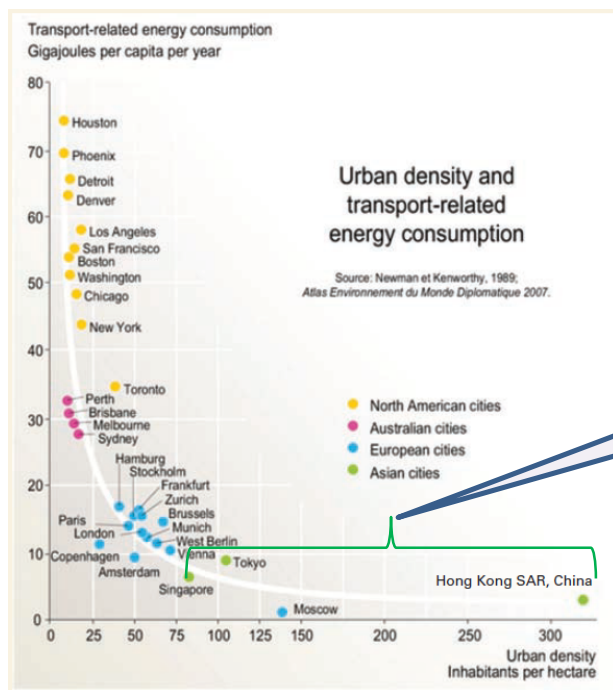
In Figure-1, it is presented the energy consumption per year of cities versus urban density. It can be deduced that there is strong correlation between urban density and energy consumption. Cities with low density consumes high energy and high urban density consumes lower energy consumption. Where more sustainable urban forms exist in Hong Kong, Moscow, Tokyo, Singapore, etc.

Figure 1: Urban Density and Transport Related Energy Consumption in Selected Cities
Source: Bournay 2008, based on Newman and Kenworthy 1989, and Atlas Environment du Monde Diplomatique 2007

Integrating Transit and Land Use towards Sustainable Urban Development

Integrated land use and transport planning may be the best way towards sustainable urban development, this approach can resolve congestion and other transport problems. Land use patterns affect travel demand in two ways: (1) the number of trips made between areas and (2) the distances of these trips. High density and mixed landuse patterns can reduce the numbers of trips made and the distances traveled. In essence, addressing land use patterns could reverse existing transportation trends of longer and more frequent trips. Integrated transport and landuse planning is the key to improving accessibility.

Well integrated land use and transport certainly promote sustainable urban development. Transit and landuse can shift travel need from private motorized vehicles to non-motorized and public transport, and reduce sprawl by promoting TODs that are served by high-quality public transit services. Public transit is inherently the most resourceful form of mobility, measured in consumption of energy or land, as illustrated by figure 1.4, which compares the amount of road space required for about 80 travelers by different modes of transportation. Reducing the amount of impervious surfaces given over to roads and parking not only shortens trip distances, it also reduces heat-island effects and water pollution (from oil-stained run-off of rain into streams).

Figure 2: Urban Space Taken by Transport Modes
Source: GTZ, 2004.
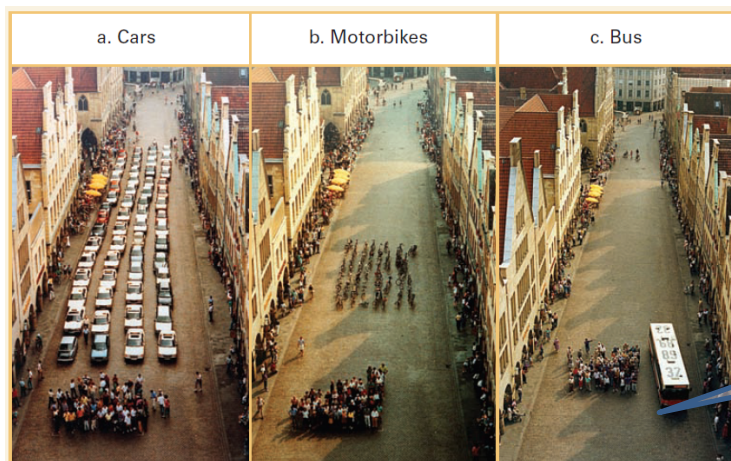
In Figure-2, it is depicted the urban road space occupied by car, motorbikes and public bus for 80 travelers. The more sustainable mode is public bus, where for 80 travelers it is needed only one bus, occupying less road space with less energy consumption, less emission.

Sustainable urban transport

One practical approach to reducing traffic congestion, GHG emissions, and other pressing environmental problems is to promote transit and land use integration. Mixed landuse is a particularly important element of sustainable development. Intermixing housing, offices, retail shops, and other urban amenities in close proximity to public transit stations integrates long-distance travel by transit and short-distance, within-neighborhood travel by foot.

Conclusions

Today, around the globe, our common goal is to make the earth surface livable for the existing living being and to cherish a vision to make it livable for our next generation. In line with this global leaders, urban managers and professionals trying hard to materialize the sustainable development agenda. To achieve the sustainable development agenda and to overcome the challenges ahead, world urban managers need to emphasize on two broad sectors – one is urban land use planning and the other is urban transport planning in a sustainable fashion. In this paper, it is presented concisely the urban development challenges and how to overcome these challenges through sustainable way.

References

UN Habitat (United Nations Human Settlements Programme). 2009. *Planning Sustainable Cities*. Global Report on Human Settlements: UN Habitat

UN Habitat (United Nations Human Settlements Programme). 2011. *Global Report on Human Settlements 2011: Cities and Climate Change*. Nairobi: UN Habitat.

OECD (Organisation for Economic Co-operation and Development). 2012. Co*mpact City Policies: A Comparative Assessment.* OECD Green Growth Studies. Paris: OECD.

Suzuki, Robert, Luchi, Urban Development Series-74630, *Transforming Cities with Transit*. Washington, DC: World Bank

Singapore Land Transport Authority (SLTA). 2008. *Long Term Master Plan: A People-Centered Land Transport System*. Singapore: SLTA.

Jean-Paul Rodrigue, 2017. The Geography of Transport System, Routledge, Taylor and Francis Group, New York

Allen, A. and N. You (2002) *Sustainable Urbanisation: Building the Green and Brown Agenda*, Development Planning Unit, London.

Acioly C., Jr. 2000. "*Can Urban Management Deliver the Sustainable City*?" In *Compact Cities: Sustainable Urban Forms for Developing Countries*, 3rd ed., ed. M. Jenks, and R. Burgess, 127–40. London: Routledge.

Altaf, A., and F. Shah. 2008. "The Spatial Growth of Metropolitan Cities in China: Issues and Options in Urban Land Use." World Bank, East Asia Region, Transport, Energy, Urban Sustainable Development Unit, Washington, DC.

OECD (Organisation for Economic Co-operation and Development). 2012. Compact City Policies: A Comparative Assessment. Paris: OECD.

UNDP (United Nations Development Programme). 2007. *Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World*. New York: Palgrave Macmillan.