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Streets as Public Spaces and Drivers of Sustainable, Inclusive and Prosperous Cities in Africa

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Abstract

Since the ancient time, streets have shaped the form and structure of towns and cities as well as of villages, serving several functions such as mobility, commerce and social interactions. They were the primary public spaces where people first meet for various commercial, economic, civic, political, cultural and social purposes. However, nowadays in most African cities, this multi-functionality of street is overlooked, and streets are usually regarded as mere links that serve motorized travel between destinations, marginalizing all other functions of streets as public spaces.

For a city to be sustainable, inclusive and prosperous, it must have a sustainable city foundation, which is composed of three elements: Urban Planning & Design, Basic Infrastructure and Policies. A sustainable city foundation is based on a planning that allows a well connected street network with sufficient land allocated to streets (25-30%) and sufficient intersections (at least 100 intersections per square kilometer). A well connected street network reduces travel time and encourage walking and social interactions. It enhances infrastructure development, environment sustainability, and economic and social development. It makes cities resilient and prepared to overcome natural disasters.

The paper assesses the share of streets and other open public spaces in urban land areas in African cities. It analyzes different components of street connectivity, such as the proportion of land allocated to streets, street density, intersection density and the Composite Street Connectivity Index (CSCI) disaggregated by city core and suburban areas in selected African cities. It demonstrates that most African cities shared common characteristics: progressive decline of land allocated to street; inadequate and deteriorating streets; and poor facilities for non-motorized transport (walking and cycling). It later demonstrates that poor street connectivity has negative impact on most dimensions of urban sustainability, inclusion and prosperity such as infrastructure, social and economical development, environment development, disaster exposure and resilience, peace and security. It finally puts forward a proposal for African cities to be sustainable, inclusive and prosperous placing streets as public spaces for all as central.

The proliferation of urban settlements that lacked improved water, adequate sanitation, durable housing and sufficient living area contributed to slum growth. Here, urban expansion is the consequence of poverty as informal unplanned settlements on the periphery spring up in response to a lack of affordable housing options within the city itself. In these cases, urban expansion results from a lack of policy attention to current urban challenges, and more particularly, an inability to anticipate urban growth, including through provision of land for the urban poor. Denial of permanent land rights to the urban poor is one of the main factors behind the “peripherization” associated with urban expansion in African cities, where two out of every three people live in slums.

Key Words:

Streets, Urban Planning, Public Spaces, Sustainability, Development, Urbanization, Inclusion, Prosperity, City, Connectivity

Introduction

Since the ancient time, streets have shaped the form and structure of towns and cities as well as of villages, serving several functions such as mobility, commerce and social interactions. They were the primary public spaces where people first meet for various commercial, economic, civic, political, cultural and social purposes. However, nowadays in most African cities, this multi-functionality of street is overlooked, and streets are usually regarded as mere links that serve motorized travel between destinations, marginalizing all other functions of streets as public spaces.

In recent years streets have been recognized as an integral factor in the achievement of sustainable urban development. Various notions of streets have been proposed, such as “livable” streets, “complete” streets, “streets for all”, “quality” streets; “friendly” streets, and “healthy” streets.ⁱ In terms of variables, these notions embrace more or less similar concepts that touch on people’s wellbeing and that make cities more prosperous. The “livable streets” movement emphasizes streets as the fabric of social and urban life. Safety, security, social interactions are among the key components of livable streets.ⁱⁱ Gehl’s early work in Copenhagen suggested the need to promote non-motorized means of mobility in order to create livable streets. Based on Gehl’s findings, in 1962, Copenhagen made a shift towards increased use of bicycles as an alternative to cars.ⁱⁱⁱ During the same period, there was also another advocate of livable streets in the United States, the writer and urbanist Jane Jacobs (1961).^{iv}

The notion of inclusiveness encompassed in “complete streets” is present in various projects around the world that advocate the planning and design of streets that take into consideration the needs of all users (ages, gender, economic status, modal means, etc.)^v. When functioning well, mobility is easy, comfortable, and safe.^{vi} The concept of an inclusive system of streets was the aim of the ARTISTS (Arterial Streets towards Sustainability) project in European Union countries. The project aimed to transform or re-design arterial streets in order to accommodate pedestrians and cyclists, among other users.^{vii/viii}

The “[complete streets](#)” movement has taken root in many countries around the world, particularly in developed countries. The movement has succeeded to influence policies in the transport sector. For instance in the United States, over 300 jurisdictions have adopted complete streets policies or have committed to do so.^{ix} Among the key issues addressed in the Toronto Complete Street project (2012) are traffic, safety and health.

All these initiatives and projects call for better street connectivity that puts people first. They recognize that livable or complete streets lay the groundwork for a healthy community. They advocate for the provision of amenities like seating, play areas, good sidewalks and trees – all these make all people, particularly children, women and the elderly feel safe and comfortable.

The extent to which any street is livable or complete can be measured by its street life, social contacts between neighbours and public health indicators.^{x/xi} There are various projects promoting livable or complete streets around the globe, but more in cities of the developed world, where there is a growing livable or complete streets movement.^{xii} From Melbourne to London, Bogota and Cape Town, the movement is promoting street life where the notion of streets as public spaces is prominent.

The paper assesses the share of streets and other open public spaces in urban land areas in African cities. It analyzes different components of street connectivity, such as the proportion of land allocated to streets, street density, intersection density and the Composite Street Connectivity Index (CSCI) disaggregated by city core and suburban areas in selected African cities. It demonstrates that most African cities shared common characteristics: progressive decline of land allocated to street; inadequate and deteriorating streets; and poor facilities for non-motorized transport (walking and cycling). It later demonstrates that poor street connectivity has negative impact on most dimensions of urban sustainability, inclusion and prosperity such as infrastructure, social and economical development, environment development, disaster exposure and resilience, peace and security. It finally puts forward a proposal for African cities to be sustainable, inclusive and prosperous placing streets as public spaces for all as central.

Chapter 1 Concept of Sustainable, Inclusive and Prosperous Cities, urban planning and streets

1.1 Concept of Sustainable, Inclusive and Prosperous Cities

A Sustainable, Inclusive & Prosperous City promotes a people-centric approach based on three core components: Sustainable City Foundation, Social Inclusion, and Institutions and Laws. These three are the pillars of the other seven dimensions of the SIPC: Infrastructure development, Environmental Sustainability, Economic development, Social development, Disasters exposure, Resilience, peace & security.



Sustainable City Foundation: For a city to be sustainable, inclusive and prosperous, it must have a sustainable city foundation, which is composed of three elements: Urban Planning & Design, Basic Infrastructure and Policies. A sustainable city foundation is based on a planning that allows a well connected street network with sufficient land allocated to streets (25-30%) and sufficient intersections (at least 100 intersections per square kilometer). A well connected street network reduces travel time and encourage walking and social interactions. It enhances infrastructure development, environment sustainability, and economic and social development. It makes cities resilient and prepared to overcome natural disasters.

Social Inclusion: For a city to be sustainable, inclusive and prosperous, it must be inclusive at the onset of its planning. It must be planned mixt. Having all the poor living together create slum and fuel instability and insecurity. Inclusive urban planning will ease access to basic services (water, sanitation, housing, education & health), and to decent employment for all.

Institutions & laws: The legal institutional framework in a give country or city plays a key role on various elements of urban planning and security of tenure. It regulates the use of land and the relationship between people and land such as acquisition or adjudication, which is the process of final and authoritative determination of the existing rights and claims of people to land. Indeed, security of tenure depends heavily to the land governance that establishes the rules, processes and structures through which decisions are made regarding access to and the use of

land, the manner in which those decisions are implemented and the way that conflicting interests in land are managed.

All other dimensions of a sustainable, inclusive and prosperous city – infrastructure development, environmental sustainability, economic development, social development, disaster exposure, resilience, and peace & security - depend heavily on these three components, which are the city foundation, the social inclusion and the institutions and laws. **Infrastructure Development** access to water services, sanitation facilities, waste management, energy, housing, land security of tenure, transport, and communication. **Environment Sustainability** is composed of elements of energy, transport, building and pollution. **Economic Development** includes elements of production, consumption, employment sectors, working conditions, social benefits and child labour. **Social Development** is composed of elements of education, health, public spaces, social inclusion and social capital. **Disaster Exposure:** is composed of elements of mitigation and adaptation to various disasters such as: flooding, wind storm, earthquake. **City Resilience** is composed of elements of City Foundation, Environment, Social Capital, Social Development. **Peace & Security:** Without peace & security, a city cannot be sustainable, inclusive and prosperous. Lack of peace & security embraces all segments of society and affect particularly women and children. Insecurity includes all forms of violence and conflicts, including domestic violence, violence in public places, crime, armed conflicts, terrorism, etc.

1.2 Streets, Urban planning and City Foundation as elements Sustainable, Inclusive and Prosperous Cities

For a city to be sustainable, inclusive and prosperous, it must have a sustainable city foundation, which is composed of three elements: Urban Planning & Design, Basic Infrastructure and Policies. A sustainable city foundation is based on a planning that allows a well connected street network with sufficient land allocated to streets (25-30%) and sufficient intersections (at least 100 intersections per square kilometer). A well connected street network reduces travel time and encourage walking and social interactions. It enhances infrastructure development, environment sustainability, and economic and social development. It makes cities resilient and prepared to overcome natural disasters.



One fundamental of the streets of such a city is the connectivity of its streets in terms of planning as well as design. With regard to planning, sufficient land should be allocated to streets and the street network should be sufficiently long to cover all areas. There must be sufficient intersections available to facilitate shorter distances and reduce travel times. Connected streets as public spaces also encourage walking and social interactions.

A sustainable, inclusive and prosperous city expands multimodal transport systems with sidewalks and bicycle paths, ensures eco-efficiency of infrastructural systems, and supports density through integrated infrastructure development, thereby enhancing efficiency and access. In addition to accommodating all kinds of users (pedestrians, cyclists, motorists), prosperous streets promote connections to services that contribute to good health and productivity, such as clean water, sewerage facilities, drainage systems, power supply, and information and communication technologies. Streets that provide space only to motorists are characterized by congestion and high CO² emissions.

Street connectivity and components of sustainable, inclusive and prosperous cities

Street connectivity refers to the density of connections in the street network and the directness of links. A well-connected street network has many short links, numerous intersections, and few cul-de-sacs.^{xiii} As connectivity increases, travel distances decrease and route options and travel modes increase (e.g. more use of non-motorized and public transport), allowing more direct travel between destinations, thereby creating a more accessible and resilient system.^{xiv} *Connectivity* includes prioritizing streets as the basic element of mobility and accessibility accompanied by the progressive provision of basic services such water and sanitation facilities.

Connected streets contribute to infrastructure development

Besides easing mobility, streets provide pathways for pipes, power lines and drainage systems, among other amenities. Evidence from most cities across the world show that areas of the city endowed with adequate streets are also areas with laid down pipes for water supply, drainage and sewerage networks, as well as power lines and information and communication technologies (such as fiber optic cables) etc. When the amount of space allocated to streets is insufficient, provision of basic services is significantly hindered. In slum areas where there are few or no streets, provision of basic services is hampered as there is no network in place that allows for the provision of water, sanitation and electricity, among other services.

Connected streets accommodate both motorized and non-motorized modes of transport

The street plays a pivotal role in setting up of urban infrastructure development. The planning and design of streets as public spaces not only has a direct effect on transport modes, but it also has an impact on provision of basic services. The street provides the connectivity pattern for the city, which is fundamental for effective urban mobility. Amongst any city's most prized assets, the street network ranks high as it facilitates the movement of people, goods and services. Street networks and mobility patterns further facilitate access to jobs, commerce, health services and school facilities in the city. Good street connectivity not only reduces traffic congestion, commuting time, motor vehicle commuters, but also reduces fares, fuel consumption, traffic fatalities, and greenhouse gas emissions in cities.

However, poor maintenance of the road infrastructure characterizes most streets in African cities. In addition, the street networks in these cities have barely kept pace with urban growth. Also, infrastructure for non-motorized transport (e.g. pavements or sidewalks for walking and bicycle lanes for cycling) is often lacking, poorly developed, on the decline or does not appear to rank high among city planners' priorities. This has led to high incidences of traffic fatalities involving pedestrians and cyclists.^{xv} Better urban infrastructure, more and safer bicycle routes throughout the city, more pedestrian-friendly streets, and well-planned transport systems that provide safe options for getting around the city are needed to curb the rise in traffic deaths. The dysfunctional nature of road infrastructure in most African cities poses a major challenge to mobility and is an important source of traffic congestion. Congested streets and poor facilities for pedestrians are the most pervasive transport problems affecting cities in the developing world. Evidence shows that traffic congestion is the main form of infrastructure deficiency plaguing cities in these regions, hindering free movement and making travel frustrating and time-consuming, according to local experts.^{xvi}

Connected streets safeguard environmental sustainability

The impact of pollutants on the ecological state of the city makes it imperative that streets as a "zone of maximum exposure" take centre stage when the study of environmental sustainability towards the achievement of sustainability, inclusion and prosperity is examined. Pollution emissions released on the street contribute to the most harmful effects on climate change, ozone depletion, ecological damage, street aesthetics, and human health. The idea that streets are a "green" public good and are public spaces is one that needs to be examined. Non-motorized

forms of transport, pedestrianization, cleaner fuels and reduced traffic congestion are just some of the measures that can limit the damaging effects of motorized transport and traffic congestion. These should be considered when planning streets of the future. A connected street network helps to safeguard environmental sustainability in easing mobility and provision of basic services with low carbon emission. By promoting walkability and cycling, connected streets contribute to the reduction of air and water pollution and to the preservation of biodiversity.^{xvii} Along with public parks, waterfronts and “green” areas for recreational and productive purposes, connected streets help to reduce fragmentation of natural systems and reduce the spatial footprint through the careful design of infrastructure networks and settlements.

Connected streets promote economic development

Connected streets promote economic growth through productivity, generating the income and employment that can elevate the living standards of the whole population. High street connectivity plays a key role in productivity. Connected streets harness the benefits of agglomeration economies; they improve access to productive advantages (knowledge, quality of the environment, etc.); they provide sufficient public space for circulation of goods and people and deploy adequate infrastructure; they encourage polycentric urban development; they allow synergies between centres and sub-centres; and they intensify urban nodes and corridors to maximize the benefits of concentration. Good street connectivity can increase economic productivity and competitiveness through increased transport system efficiency that reduces traffic congestion and commuting costs. Efficient and fast transport, in turn, can increase labour productivity by reducing commuting times, and increasing worker productivity. Streets also play an important role in direct economic activities, such as street vending. Businesses along streets have higher sales when there are more pedestrians and cyclists using these streets. Consequently, there is a rise in employment, income, property values and tax revenues. Well-connected streets attract both formal and informal businesses.

Connected streets enhance social development

Social development is increasingly associated with an inclusive, well-planned, healthy and supportive environment. Sustainable mobility systems, green open spaces and cultural and sports facilities are major factors contributing to social development, including better quality of life. They ease the provision of social and health services required for improved living standards. The ways in which we design and build streets have significant implications for health and quality of life. With the increased use of cars, a sedentary lifestyle is becoming more common among the urban middle and upper classes; this contributes to an increase in obesity, in addition to increasing air pollution and greenhouse gas emissions. Streets that promote walkability and cycling as elements of an active lifestyle contribute to healthy living, as well as reduction in vehicle emissions.^{xviii} Many important quality-of-life benefits also arise when streets promote non-motorized transport. Increased outdoor activity and reduced air pollution translate into better public health.

Connected streets promote social inclusion, peace & security

Connected streets promote social inclusion by ensuring high quality public spaces that promote interaction among communities; by improving safety and security; and by promoting green spaces. It is in any city’s best interest to promote use of streets as public spaces that promote social inclusion, equity and safety.^{xix} No city can claim to be prosperous when large segments of the population do not have access to streets. Connected streets enhance access to

a range of well-located, adequate public infrastructure and amenities (including education, health, recreation, etc.) for all groups, including the poor, the young, women, the old and the disabled. They also facilitate the creation of mixed neighbourhoods with a diversity of jobs and housing options; promote mixed-used land development, ensure involvement of marginalized groups; and improve connectivity between neighbourhoods and access to services.

Connected streets enhance resilience and reduce exposure to natural disasters

1.3 Concepts and measures of street connectivity and sustainable, inclusive and prosperous city index

A variety of measures of street connectivity have been used in various fields, including transport, urban planning, geography, and landscape ecology. There are various indices that have been created to directly or indirectly measure street connectivity in an area. Stephan J. Schmidt and Jan S. Wells (Transit Village Monitoring Research, October 2005) recommend that for a best connectivity measurement, research should be done to construct a composite street connectivity index that includes the usual quantitative measures and other qualitative measures. Although all these indices are relevant to assess connectivity, we have selected only those that are relevant for policies and those for which large sets of data are available. These indices are: land allocated to streets; street density; intersection density; connected node ratio; and link-to-node ratio. These are likely to be highly, positively correlated to each other, and can be expressed through a composite index.

Composite Street Connectivity Index (CSCI)

Having data on the proportion of land allocated to streets is not sufficient to assess the connectivity of a street. A city (or neighbourhood) can have wide streets in a very limited street network and low intersection density, which does not always imply high connectivity. For example, a lengthy network and dense intersections on very narrow streets do not also promote high connectivity. A combination of the three variables is therefore required to capture the degree of connectivity of a street network. That is what a *Composite Street Connectivity Index (CSCI)* does.

CSCI is computed using the following five street indicators: i) proportion of land allocated to streets; ii) street density and ; iii) intersection density. The closer the CSCI is to 1, the more connected is the street network of a city. On the contrary, the closer the CSCI is to 0, the less connected is the street network of a city. The index is computed by using the geometric mean of the five dimensions as shown below:

$$\bullet \quad \text{CSCI} = X_1^{1/5} * X_2^{1/5} * X_3^{1/5}$$

Where: CSCI = Composite Street Connectivity Index; X_1 = Proportion of Land Allocated to Streets; X_2 = Street Density and ; X_3 = Intersection Density

Data and sources

Information on streets is scarce for most African cities, and when it exists it is diluted with data on transport. Indicators to assess the multifunctionality of streets is lacking for most African cities, where the focus is more on the mobility function of streets rather than their social and economic functions. The lack of reliable data on streets has held back the development of effective urban policies aimed to tackle lack of basic services and transport in African cities. The most common indicator for streets is street density, which measures the length of street networks per one square kilometre.

The first is an in-depth study of streets conducted in selected cities that required the use of satellite imagery and field verification. With the popularity of GIS mapping, remote sensing data and GPS tools, the most scientific way of calculating any area was through these geo-spatial tools.^{xx} In order to have a more inclusive assessment of street connectivity, all information and data included in this study and its analysis was done bearing the above limitations in mind. In addition to the use of satellite images, documents from government line ministries in charge of roads were consulted in order to better understand the policies guiding street planning and design. Another important source of information on community service delivery is the Demographic and Health Survey (DHS) that also provides information on access to basic services, such as schools and clinics at the community level in over 30 cities. Each enumeration area of a neighbourhood was geo-referenced through GPS allowing the mapping of infrastructure information in association with social and economic data.

This analysis of the state of streets in African is based on 44 cities. Fifteen cities are capital cities or large cities (more than one million inhabitants). Though they do not represent all cities of Africa, they allow us to analyze and to identify some regional variations in street connectivity. Seventeen cities are from the Lake Victoria Region allowing analysis of streets in small cities and towns compared to cities in their countries respective: Kenya, Tanzania and Uganda. Ten cities are from Senegal allowing inter-city differential analysis.

Chapter 2 State of African streets

2.1 Levels and variations of land allocated to street

Most African cities share common characteristics: inadequate and deteriorating transport infrastructure; and poor facilities for non-motorized transport (walking and cycling). One effect of these problems has been the further marginalization of the most vulnerable segments of society who rely the most on public transport and cannot afford private alternatives. However, these similarities do come with differences as well—in terms of size, geography, cultural setting and administrative structure – which are considered in this analysis.

The following sections analyze three components of the Composite Street Connectivity Index (CSCI): land allocated to streets; street density; and intersection density. Cities are classified into four groups according to the level of land allocated to streets at the city core. The rationale behind choosing the city core of these cities for analysis is the fact that it provides more variations across cities compared to suburbs, which are generally poorly connected in most of these cities.

Land allocated to streets

A large majority of African cities allocate a very small proportion of land to streets: out of the 18 African cities included in this study, 13 allocated less than 15 per cent of land to streets, with the lowest level (6 per cent) observed in Bangui in the Central African Republic. Other cities in this group have more land allocated to streets, but the levels are still very low, varying from 10 per cent in Tanzania's major city Dar es Salaam to 14.3 per cent in Senegal's capital Dakar. Lack of streets means that cities' ability to provide services, such as safe water and adequate sanitation, is severely hampered. Water and sewerage systems are usually planned along existing street networks, and when these are non-existent, they make it difficult for authorities to provide these services.

Graph 2.1 Land allocated to streets

The grid system was prevalent in Greek and Roman cities influenced the planning of most European cities of the 18th and 19th centuries was also extended to Africa, during the colonization period, with wide boulevards oriented towards places of political and economic interest.¹ However, this influence is limited to a small proportion of the city core, leaving the rest of the city poorly served with streets. Indeed, except for their large boulevards, most African cities are poorly served by local and connector streets. For instance, the streets of Bangui are narrow and short (4.7 km per square km) and the street network is disconnected (15 intersections per square km).

However, regardless of the level of connectivity in the city core, in the suburban areas of African cities, not only are there few streets built (with less than 5 per cent of land allocated to streets), but those that exist are narrow and disconnected, except for one or two arterial streets passing through neighbourhoods. The city of Dakar offers a typical example: the proportion of land allocated to streets in the suburbs is more than three times lower than its level in the city core (3 per cent versus 14 per cent). Out of the 18 African cities included in this study, only five cities belong to the group with low to moderate levels of land allocated to streets; these are Abuja in Nigeria, Cairo

in Egypt, Casablanca in Morocco, Johannesburg in South Africa and Harare in Zimbabwe. The moderate levels of land allocated to streets in these cities such do, however, facilitate the provision of other services, such as water and sewerage, which are normally laid out along the paths of existing streets. The provision of basic services is almost universal in these cities in general, with connections to piped water, as well as to sewerage systems. However, considering the high frequency of flooding in some of these cities, we can assume that the opportunity offered by the availability of streets is not equally exploited to set up adequate drainage systems.

In African cities, suburbanization is mostly synonymous with slum expansion, except for some pockets of gated suburbs occupied by wealthy families. (Urban growth and slum growth often occur simultaneously in African cities, as described in the *State of the World's Cities Report 2006/7*.) Urban expansion is often the result of poor households moving to the outskirts because they cannot afford to live in the city centre. The suburban areas have street connectivity levels similar to those of slum areas, with irregular street patterns with multiple unplanned dead-end roads. These dead-ends are not the result of city planning but the result of the addition of plots by land owners who subdivide land in search of profits. In this situation, it is common to find a street ending where a subdivision starts. The result is a high frequency of dead-ends with few intersections that do not promote connectivity.

Suburban areas comprise both high-income neighbourhoods and low-income ones. Both types of neighbourhoods are poorly connected, but due to different levels of population density, the per capita land allocated to streets is quite different, with high-income neighbourhoods having higher levels than poorer ones. For instance, in Kenya, the slum of Kibera, an informal settlement in the city of Nairobi that has the lowest level of land allocated to streets (3 per cent) in a short network with few intersections, holds the highest population density. However, in the case of Nairobi, low population density does not translate into higher levels of land allocated to streets. In the upmarket residential area of Muthaiga that hosts the wealthiest of the city, the proportion of land allocated to streets is similar to that allocated to Kibera. Muthaiga is not densely populated; the land in this neighbourhood is more dedicated to stand-alone houses within large plots (1 acre or more) than to streets or other public spaces. However, if we consider the population density, the street density per capita is much higher in Muthaiga than in Kibera, as has been observed in gated communities in the developed world.

In the early 1900s, most African capital cities were originally planned for less than 100,000 people; today they host millions of people. Old city plans did not anticipate rapid urban growth at the outset. New planning is required that takes into consideration these new urban forms and structures. For example, new housing is being built without allocating adequate space for streets, parks or recreation centres. This means that families living in multi-storey apartment blocks have few places within their neighbourhoods for leisure and entertainment. In many cases, the apartments are built in areas that have no paved streets and residents have to use muddy lanes to access their homes and the main roads. The immediate consequence of this is a reduction in the quality of life, and less social inclusion. All the components of a sustainable, inclusive and prosperous city are thus sacrificed at the altar of increased profits for land owners and real estate developers. A typical example of the change from single houses to high-rises without changing the street planning is the middle-income neighbourhood of Kileleshwa in Nairobi. What is happening in Kileleshwa will most likely happen in upmarket suburbs of the city.

The large gap between street connectivity in the city core and in the suburban areas is a reflection of the huge inequalities in most African cities. The highest income inequalities are observed in Cape Town and Johannesburg. In South Africa, the huge inequalities in access to land between the city core and the suburbs are the result of spatial demarcation between European settlers and the indigenous African population (most starkly represented by the past policy of apartheid), with the latter living in dilapidated, crowded and unserved settlements. Although the Composite Street Connectivity Index is relatively moderate in the city core of Cape Town, it is very low in the suburban areas of cities in this group.

2.2 Conditions of streets

Besides the low level of land allocated to streets, the street networks in most African cities are generally substandard. Streets lack service lanes, pavements and are poorly maintained, with limited street lighting the street planning and design do not anticipate the polycentric form of cities and the rapid increase in the use of private cars. In most African cities, few streets are paved and most lack sidewalks. For instance, in Ouagadougou (Burkina Faso) and Kigali (Rwanda), only 11 per cent and 12 per cent of the streets are paved, respectively, reducing accessibility for buses in densely populated neighbourhoods and outlying areas. Data from the UN Millennium Cities Database on paved street density measured by the length of paved streets in metres per 1,000 inhabitants shows that in most African cities, the paved street density is less than 300 metres per 1,000 inhabitants. This level is very low compared to Asian and Latin American and Caribbean cities where the average level of paved street density is at least 1,000 metres per 1,000 inhabitants. The data also shows that there are no sidewalks in 65 per cent of the street networks in Africa. In some cities, sidewalks are quasi-non-existent; only few streets, mainly in the central business districts, have sidewalks. In many residential areas, streets are not even paved, let alone have sidewalks. Where they do exist, sidewalks are poorly maintained and contain open drains. It is also common in cities of the developing world to find properties encroaching on sidewalks, forcing pedestrians onto the streets where they have to face careless motorists. Pedestrian crosswalks and bridges are not provided, except in the city centre. Although crosswalks without signals are provided in some places, such as the central business district, they are seldom respected by motorists or enforced by the authorities.

UN-Habitat's community profile studies conducted in 25 cities between 2003 and 2012 indicate that most of the streets in African cities lack pavements/sidewalks. While most studies in Africa cover only capital or large cities, this survey provided the unique opportunity to assess the conditions of streets in small and secondary towns – the cities of tomorrow. Indeed, if these cities are not well planned now, they will face the same problems that capital and large cities are facing today. Unfortunately, findings from the community profiles of 17 small cities and towns of the Lake Victoria Region (Kenya, Tanzania and Uganda) show that these towns and cities are using similar paths as capital and large cities of today, with limited streets, no pavements, and no street lighting. However, it will be much easier to solve the street network in these small and secondary towns than in large cities.

Chapter 3 Urbanization, Urban land Expansion and Urban Planning

3.1 Historical perspective of urban planning and streets in African cities

Streets have played a determining role in the cultural, social, economic and political functions of cities. The historic city of Cairo, built between the 7th and 10th century after the Arab conquest, adopted an organic pattern of streets with a large number of dead-end streets.^{xxi} The city of Addis Ababa, founded in 1886, also did not adopt any particular type of street system; it was literally a city without regular street patterns. Only with the final decision to halt the movement of the imperial court connecting bridges and streets were laid-out in an organic manner along the undulating terrain.

The grid system which was prevalent in Greek and Roman cities influenced the planning of most European cities of the 18th and 19th centuries was also extended to Africa, during the colonization period. Cities in colonial Africa adopted the grid system, despite resistance from indigenous populations. For instance, before the advent of French

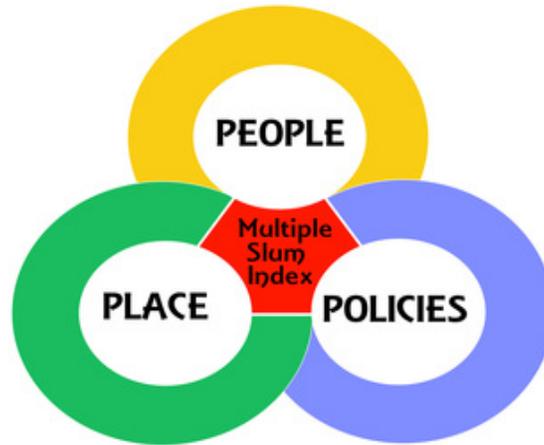
colonialists, Dakar in Senegal constituted villages organized around mosques in a circular pattern around an open central space, reflecting the influence of Islam on local spatial organization.^{xxii} However, the arrival of French troops in the 19th century changed the face of Dakar with the French imposing a city plan that reflected the city plan of Paris, with large boulevards and avenues. Reflecting the military-led development of the city, these boulevards were designed perpendicular to a military fort in order to ease colonial troops' access throughout Dakar.^{xxiii} However, Dakar has a dual planning system with districts that were exclusively for Europeans and others that were for the local Africans. Expelled from the centre, the indigenous people were left to their own devices in overcrowded areas where streets were irregular and unserved, with no adequate sewerage and drainage systems. This marked the beginning of the segregation of distribution of basic services through urban planning in Dakar and other West African cities.^{xxiv} Construction with temporary building materials was authorized in the indigenous settlements, but “the inhabitant only obtained a property title when built out of permanent materials”.^{xxv} Rather quickly, in the 1950s, the authorities were overwhelmed by the arrival of new migrants, and many shantytowns appeared on the non-developed urban fringes. It was at that time that a new policy of massive exodus of the “illegals” toward the periphery began.^{xxvi} This kind of urban divide was also a hallmark of British colonialism in Africa, when in the early part of the 20th century cities such as Nairobi and Harare were planned along racial lines, with the local Africans being relegated to the least serviced parts of the city, while the Europeans laid claim on the planned parts of the city that enjoyed superior services and better infrastructure.

Similarly, the walls around the old historic city of Mogadishu in Somalia were pulled down in 1920 when the Italian rulers embarked on a programme to make the city the political and administrative capital of Italian Somaliland, with wide boulevards, modern government buildings and scenic waterfronts.^{xxvii} The duality in the planning of the city was also observed.

3.2 Urbanization, peripherization of urban growth and expansion

Independence in African countries led to massive rural-to-urban migration as migrant workers sought jobs in capital cities. For instance In the early 1950s, the city authorities of Dakar in Senegal were overwhelmed by the arrival of new migrants, and many shantytowns appeared on the non-developed urban fringes. Suburbs – so named because these areas were situated beyond the main urban core and lacked employment opportunities and urban facilities, such as high-level services – dominated the physical growth of cities in these regions throughout most of the 20th century and continues into the 21st century. The monocentric form of street design and planning that characterized many cities in the colonial era started to change in the 20th century and accelerated with the independence of countries from the 1950s onwards. Street designs became more irregular following the peripherization of urban growth, which saw poor families move to the outskirts to areas that lacked basic services. The proliferation of urban settlements that lacked improved water, adequate sanitation, durable housing and sufficient living area contributed to slum growth.^{xxviii}

Slum dwellers in African cities are generally characterized by lack of access to basic services. They live in unplanned, informal settlements with high risk of exposure to disaster. Without secure tenure in absence of institutional protection, they are constantly exposed to eviction. Their lives finally manifest at three levels: at the **p**eople level with lack of basic services; at the **p**lace level living in unplanned settlements; and at **p**olicy level with lack of secure tenure without institutional protection against eviction.



Today, 40 per cent of African live in urban areas. With rapid urban growth, it is projected that the majority of African populations will reside in cities and towns by 2035. It is, however, important to note differentials in urbanization within the African region. For instance, while in Southern Africa and Northern Africa the majority of the population has already been living in urban areas for the last 20 years and 8 years, respectively, in Western Africa and Eastern Africa, with urbanization levels of 45 per cent and 24 per cent in 2010, respectively, the majority of the population will live in urban areas in 2020 and 2050, respectively.^{xxix}

Figure 3.1 – Urbanization in Africa, 20th -21st century

Rapidly increasing urbanization levels from the 20th to the 21st century have been accompanied by spectacular growth in city size. While most cities analyzed here had less than 100,000 inhabitants in the 20th century, their populations in the 21st centuries began reaching the one million mark, and by the end of the 20th century cities such as Cairo and Lagos were megacities with more than 10 million inhabitants. The population Abuja and Dakar increased from 19,000 to 2 million, and 200,000 to 2.9 million, respectively.^{xxx}

Figure 3.2 City Population trends and density in selected cities 1950-2010

3.3 Peripherization of urban growth - proliferation of irregular, narrow streets

In most African cities, urban expansion has taken the form of “peripherization” that is characterized by large peri-urban areas with informal or illegal patterns of land use, combined with a lack of infrastructure, public facilities and basic services, and often accompanied by a lack of both public transport and adequate access roads. Here, urban expansion is the consequence of poverty, not affluence, as informal unplanned settlements on the periphery spring up in response to a lack of affordable housing options within the city itself. In these cases, urban expansion results from a lack of policy attention to current urban challenges (slums, land, services, transport, etc.), and more particularly, an inability to anticipate urban growth, including through provision of land for the urban poor. Denial of permanent land rights to the urban poor is one of the main factors behind the “peripherization” associated with urban expansion in developing countries.^{xxxii}

Peripherization of urban growth is synonymous with slum growth in most African cities. Slums are characterized by the absence of basic services, such as improved drinking water and adequate sanitation, along with insecure tenure, non-durable housing and overcrowding in unplanned settlements. Two out of every three people living in African cities lives in a slum. UN-Habitat estimates indicate that (in 2012) slum prevalence – or the proportion of people living in slum conditions in urban areas – was highest in sub-Saharan Africa (62 per cent). Today our estimate show that little improvement has been made and six out ten urban dwellers are living in slum.

Figure 3.3 Proportion of urban population living in slum areas in 2015

The streets in the suburban areas of African cities often resemble slum areas, with irregular street patterns with multiple unplanned dead-end roads. These dead-ends are not the result of city planning but the result of the addition of plots by land owners who subdivide land in search of profits. In this situation, it is common to find a street ending where a subdivision starts. The result is a high frequency of dead-ends that are quite different from the planned street dead-ends (cul-de-sacs) observed in cities of the developed world in that they are not planned and continue to sprawl. In African cities, street planning has taken on a hybrid or irregular nature, resulting in haphazard urban development. African cities such as Abuja have adopted hierarchical streets in planned parts of the city, following a trend that has been emerging in the developed world since the second half of the 20th century.

Lack of streets an obstacle to provision of basic services in slums and suburban areas

Slums are defined by the absence of these services, along with lack of secure tenure, non-durable housing and overcrowding. One out of every three people living in cities of the developing world lives in a slum. UN-Habitat estimates indicate that in 2012 slum prevalence – or the proportion of people living in slum conditions in urban areas – was highest in sub-Saharan Africa; 62% of the region’s urban population lives in a slum, compared to 13% in North Africa and 33% globally. At the beginning of the MDGs in 2000, 67% of urban dwellers in Sub-Saharan Africa live in slums, and the MDGs is ending this year, 2015, without six of urban dwellers in Sub-Saharan Africa still living in slums conditions despite the fact the target has been globally reached with the improvement of the lives of more than 200 million dwellers worldwide.

In absolute terms, the number of slum dwellers continues to grow in Sub-Saharan African cities, due in part to the fast pace of urbanization. The number of urban residents living in slum conditions is now estimated at some ...million, compared to ... million in 1990 and ... million in 2000. Redoubled efforts will be needed to improve the

lives of the urban poor in African cities and metropolises.

Figure

Streets are the starting point for a physical integration of slums into the formal and official systems of planning and urban management that govern a city. A mix of approaches, comprised of laying down the street pattern with new streets, main roads, road widening, pedestrian pathways and traffic management must be deployed in order to meet the planning objectives. The creation of new roads and the upgrading of existing roads and streets need to take into consideration various likely impacts of such actions. It should not only respond to different functional requirements, but also guide development and capture the value enhancement of surrounding properties. Investments in infrastructure, streets, public space and increased accessibility generate property valuation and production of wealth. This, along with ensuring the continued maintenance of streets, is a key challenge for urban management.

A street pattern and hierarchy are laid down by an area-based plan that results in a final urban settlement layout connected to the overall city plan. This provides a strong spatial frame to deal with the complexities of regularizing tenure and retrofitting services as part of urban networks, the two key interventions of slum upgrading. The street is a vital element in the improvement of quality of life in slums, particularly in densely occupied settlements where the inadequacy of streets is the source of multiple problems faced by slum dwellers. There are no studies to quantify the impact that poor streets can have on a community, but it is well known that poor quality streets and difficulties in accessibility and connectivity are key indicators of neglected down market areas in cities.

Streets in slums have multiple functions, more than in other neighbourhoods. This is because in most slums streets are the only public space available. Streets in slums tend to be multi-layered entities instead of clearly zoned areas of use and types. They are host to multiple activities which co-exist and replace each other at different times of the day. They serve as transport space within the slum for pedestrians and passenger and goods vehicles and connect the slum with the city.

Streets provide the pathway for pipes, power lines, street lighting and drainage systems in upgrading projects and define the address and location of residents and businesses. Thus street addressing is part and parcel of the urban transformation that slums need to go through in order to become integrated neighbourhoods in a given city.

Lack of adequate drainage systems, the source of flooding in cities of the developing world

In slum areas, people live on dirt roads with poor drainage that contributes to serious flooding during the rainy season. The community profiles conducted by the Global Urban Observatory through its Urban Inequity Survey (UIS) in 20 African cities during the period 2003-2012 show that residents often complain of polluted and foul-smelling neighbourhoods.¹¹ In many African cities, flooding occurs every rainy season. Results from the community profiles show that flooding ranks amongst the top concerns of slum dwellers in cities of the developing world where waste water and solid waste find their way onto tiny, unpaved streets. This makes the streets inaccessible, particularly during the rainy season. Flooding is also the source of accidents, particularly amongst children and the elderly. In addition, it spreads disease as contaminated water is the source of many water-borne diseases.

Lack of streets – obstacles to mobility in slums and suburban areas

Despite lack of street connectivity, slum dwellers have no choice but to walk. For slum dwellers, walking is not a

choice, it is a necessity – in their case, walking is not an indicator of their city’s livability, but lack of affordable transport alternatives. In most African cities, the poor walk to reach their places of work because they cannot afford the cost of public transport. In slum areas, most people are forced to walk to reach services and facilities using narrow, unpaved streets without sidewalks. In fact, The few streets built are arterial and are meant for motorized means of transport.¹² Pedestrians are exposed to car accidents, which sometimes claim their lives.¹³

In African cities , defining street walkability by the high number of pedestrians, as observed in the developed regions, is not appropriate. While in developed regions it is assumed that a walkable street is more attractive to people for various reasons, and in fact, defines the “livability” of a city, in African cities, walking on streets is not a choice, but a necessity due to lack of other affordable transport alternatives. In addition, the walkability of the streets in most cities is severely hampered by a lack of sidewalks, which makes walking hazardous. The irony is, in cities of the developing world, where rich people tend to live in gated communities, the existence of well planned and served streets does not imply social and cultural interactions amongst neighbours. The relatively more walkable streets in high-income areas do not encourage people to use them, partly because walking is associated with poverty. Rich people will often use their cars for the shortest trips, and thus it is not unusual to see empty streets and sidewalks in high- income areas.

Cycling in African cities

Streets in Africa also lack bicycle paths. Like pedestrians, cyclists are pushed off the road by cars. This is the cause of a high number of accidents involving cyclists. However, it is important to note that cycling is not yet a common practice in many cities of the developing world as it is in cities of the developed world. Very few households own a bicycle. Less than 25 per cent of households in cities of the developing world, especially in Africa, own bicycles compared to near universal ownership in cities of the developed world. Less than 5 per cent of the populations of cities in Lesotho, the Democratic Republic of the Congo and Liberia own a bicycle.¹⁴ While in cities of the developed world, cycling for leisure is common, and now an increasing number of people are cycling to workplaces, in the cities of developing countries cycling is still uncommon. However, there is a growing use of motorcycles in African, Asian and Latin American and Caribbean cities; this increase could be associated with the increased use of motorcycles as “taxis”.¹⁵

In Ouagadougou a large proportion of people use bicycles and motorcycles to reach services such as work places, health centres, educational facilities in unpaved streets with no facilities for cycling and motorcycling.

Public transport in African cities

Due to their bad condition, the streets in developing regions discourage the use of large buses and promote the use of minibuses, taxis, and motorcycles, which have greater maneuverability than large buses but are not as efficient a means of urban mass transit. Beyond these general failings, little attention has been paid to other matters that facilitate the operation of public transport systems.¹⁶ Dedicated bus lanes are rare, or absent altogether. Bus stops, bus shelters, and other facilities for passengers are scarce and in a poor condition.¹⁷ Bus terminals are little more than overcrowded parking lots, with no facilities for passengers.¹⁸

The supply of public transport services is also increasing in North Africa, with light rail and tram systems available in Cairo, Casablanca, Rabat, Algiers and Tunis. Metro systems are now servicing the population in Cairo (Egypt)

and Dubai (United Arab Emirates).¹⁹

While in cities of the developed world, there are plans to transform arterial streets to accommodate pedestrians, and further to create livable streets, in African cities national and local authorities are more preoccupied with building arterial streets for motorized vehicles, thereby ignoring the needs of pedestrians that constitute the biggest users of streets. In these poorly planned arterial streets neither sidewalks nor bicycle lanes are provided. This is common in most cities of the developing world where a low proportion of land is allocated to streets and traffic congestion is a major concern. Here city authorities put more emphasis on tackling traffic congestion than improving the mobility of pedestrians and cyclists. A recent example of this is the newly-built Thika Superhighway that links the Kenyan capital Nairobi to Thika and Nyeri towns in central Kenya.

Faced with multiple problems associated with lack of streets or poorly designed streets, many cities in Africa, Asia and Latin America and the Caribbean that have moderate levels of land allocated to streets are adopting the bus rapid transit (BRT) system. From Cape Town and Curitiba to Bogotá and Beijing, the adoption of BRT is providing an alternative to individual cars. In Africa, bus rapid transit (BRT) systems have been introduced in Lagos (Nigeria) and Johannesburg (South Africa) generating substantial benefits for residents. Perhaps most notable are China's growing investments in metro and BRT systems, servicing millions of passengers in urban areas. Latin America has relatively good formalized public transport in cities such as Montevideo (Uruguay), Bogotá (Colombia) and Rio de Janeiro (Brazil). A growing number of urban BRT systems in Brazil, Colombia, Chile, Ecuador, Peru and Venezuela have also expanded public transport services significantly.

While BRT allows the transport of more people, there is one problem that will remain unsolved – walkability. Cities of the developed world adopted BRT long ago and are now focusing more on the re-design of streets to accommodate pedestrians and cyclists. Cities in less developed regions of the world need to do the same.

Streets for All: Walking, Cycling and Public transport

The livable street movement is timidly taking off in some African cities. There is a basic spatial structure of streets in the city of Cape Town that can accommodate all users when they are well designed. Cape Town has joined the livable streets movement that originated in the developed countries. The movement aims to promote streets for all and make cities livable and become more pedestrian- and cyclist-friendly by reducing motorized transport. Within the existing street network, the city of Cape Town is re-designing its streets by allocating more spaces for walking, cycling and promoting the use of public spaces.²⁰

Photos of Cape Town streets

Design measures that enhance the pedestrian environment include expanding sidewalks, planting trees and installing benches or other seating. All these initiatives have a common set of objectives: to enhance environmental sustainability, social interaction, public health, productivity and social inclusion, the key components for a city to be sustainable, inclusive and prosperous. However, these initiatives are still not addressing problems faced by the urban poor who live in suburban areas and slums. Most suburban areas and slums are poorly served with streets; this further hinders the provision of basic services, such as connections to water and sanitation facilities. Lack of street networks in these areas also reduces the urban poor's transport choices.²¹

Streets and Sustainability, Inclusion and Prosperity

Four African cities belong to this group, namely, Dakar, Nairobi, Accra and Dar es Salaam. In these cities, except Dakar, the CSCI is below 0.300, a level characteristic of under-served suburban areas. In addition to that Nairobi and Accra suffer from huge inequalities, with wide gaps between the poor and the rich.⁹ Although the coverage of water is relatively good, access to sewerage systems constitutes an obstacle in all these cities. Nairobi has a better infrastructure development index than Accra, but scores poorly when it comes to equity and social inclusion, compared to Accra and Dar es Salaam. The low sustainable, inclusive and prosperous city index in most African cities is due to very poor street connectivity with a CSCI of 0.300. Most African cities score poorly on several components of the SIPC index. Poor connectivity and Low productivity are the main factors leading the poor performance of Accra on the overall SIPC index.

Street connectivity and other components of prosperity

For comparability reason, the study includes cities from other continents. Streets are a determining factor in the prosperity of cities, both directly and indirectly. They impact all components of prosperity, that is, infrastructure development, environmental sustainability, productivity, quality of life and equity and social inclusion. Street data associated with these five components helps to assess the degree to which streets are linked to these components of prosperity.

Using the Pearson correlation, it has been established that the most direct associations are between streets and infrastructure, on the one hand, and between streets and productivity, on the other hand, with an R square of 0.433 and 0.428, respectively. They are followed by quality of life with an R square of 0.331. Association between streets and environmental sustainability is not strong based on the data available (R^2 is 0.181) as previously emphasized. Association between streets and equity did not also prove to be significant based on the data available (R square is 0,071). The low level of direct association between the street index and the environment index (measured with the level of PM10) can be due to various factors, one of which is the fact that those cities that have good street coverage are also those where more people can afford cars. Here, the lack of strong association can be attributed to the differential in frequency of motorized means of mobility. With equal frequencies, it is possible that the relation between the street index and the environment index will be significant. Regarding inequalities, the indicator used is income inequality; various indicators of social inclusion, such access to work, health services and basic services, are not association between street coverage and social inclusion.

Cities that enjoy a high Composite Street Connectivity Index, such as Tokyo and Hong Kong and cities of developed countries, are also those that have a high infrastructure development index and high productivity. Except for Auckland, the Infrastructure Development Index is higher than 0.9 in all these cities. Provision of basic services (water, sanitation and drainage facilities) is quasi-universal in these cities, with an index close to 1.

Provision of urban infrastructure such as water, sanitation is positively correlated with good street connectivity, as shown by the coefficient of correlation of 0.43 between the CSCI and the basic services index. However, the fact that the coefficient correlation is only 0.43 as opposed to a figure closer to 1 indicates that there are factors other than street connectivity that determine the provision of basic services. Those factors are associated to the economic capacity of a city to afford connections and other basic infrastructure. Another important element influencing the correlation is the threshold of land allocated to streets required for the provision of basic services such as water and sanitation. If for instance only 10 per cent is required, once this threshold is reached the association is no longer the level of street coverage but other factors that may be economic or political. What is clear, however, is low street coverage is associated to low provision of basic services.¹⁰

Infrastructure development through good street connectivity is key to the economic and social development of cities of developing countries. In the absence of infrastructure development that promotes access to basic services, inhabitants of cities of developing countries will continue to languish in slum areas.

Although the relationship between street connectivity and health is not as direct as it is between street connectivity and infrastructure development, it is significant with a coefficient of correlation of 0.33. By improving access to basic services such as improved water and adequate sanitation, good coverage in street may contribute to good health among the population, particularly among children who are exposed to environmental diseases such as diarrhea and respiratory diseases. There are other components of health such as obesity and heart diseases which are not captured in the current health index.

In the case of Beijing and cities of middle income countries with high economic growth rate, it is important that measures are taken to safeguard environmental sustainability while contributing to the prosperity of cities. The creation and (re) distribution of the benefits of prosperity should not destroy or degrade the environment. The natural assets of cities should be preserved for the sake of future generations and to promote sustainable development. By promoting walkability and cycling, prosperous streets contribute to the reduction of air and water pollution and to the preservation of biodiversity. Streets should be considered and planned as “green” public spaces. Non-motorized forms of transport, pedestrianization,

Key findings

One critical finding is that the Sustainable, Inclusive and Prosperous City Index Index is higher than 0.800 (compared to the maximum, 1) among cities that enjoy high street connectivity, good infrastructure development, good environmental sustainability, high productivity and quality of life, and also high levels of equity and social inclusion. In other terms, these cities do well in all components of prosperity, including street connectivity. Provision of basic services (water, sanitation and drainage facilities) is quasi-universal in these cities. With good street connectivity, these cities also enjoy high productivity with optimal commuting time to work and other services. They have a high productivity index associated with reduced traffic congestion and improved walkability through better street connectivity.

In these cities the quality of life associated with health and safety is amongst the highest globally. Indeed their citizens enjoy public spaces, green spaces and walkable streets. With many streets re-designed to promote pedestrians and cyclists, it is expected that the quality of life in these cities will improve further. By promoting walking and cycling, obesity and related heart diseases will decrease. Although, there is long way to go regarding equity and social inclusion, these cities enjoy availability of sufficient land allocated to streets which is a prerequisite for the achievement of “livable streets” or “complete streets” and other socially-conscious projects. Promoting streets for all, particularly for pedestrians, cycling and public transport are driving the wheel of urban prosperity towards prosperous streets, streets that promote infrastructure

Cities which are at the bottom of the SIPC index bracket are those that perform poorly in almost all components of the SIPC index. Much remains to be done in terms of city planning, quality of life, infrastructure and environment. Production of goods and services is still too low, a reflection of underdevelopment. Historic structural problems, poor urban planning, chronic inequality of opportunities, widespread poverty, and inadequate capital investment in public goods are critical factors contributing to such low levels of prosperity. Poor performance of the main core components that require more sustainable city foundation with more effective urban planning, laws, regulations, and

institutions that can pave the way for a more sustainable, inclusive and prosperous future for these cities. One main physical characteristic of these cities is high prevalence of slum areas or informal settlements, most of them lacking streets. These areas, not well or adequately served by streets, suffer from crumbling and/or over-stretched basic services characterized by regular water shortages, leakages, burst water pipes, leaking sewers, power outages, and uncollected refuse. In addition, infrastructure for non-motorized transport (e.g. pavements or sidewalks for walking and bicycle lanes for cycling) is often lacking, poorly developed, on the decline or does not appear to rank high among city planners' priorities. This has led to high incidences of traffic fatalities involving pedestrians and cyclists. To be prosperous, these cities need well-connected streets. They must prioritize streets as the basic element of mobility and accessibility accompanied by the progressive provision of services (e.g. water and sanitation). This will boost productivity and contribute to high quality of life.

However, there are promising African cities that perform well in some components of the SIPC index but fail in others. For instance, Cape Town, Medellin and Bangkok belongs to the same CPI group, but for different reasons. Cape Town and Medellin suffer from high income inequalities with an equity index of 0.217 and 0.394, respectively. Despite their capacity to provide goods and services in a good infrastructural environment, many people in these cities are left behind and don't fully enjoy the prosperity of their cities. Bangkok has strong infrastructure development, a moderate productivity index, quality of life index and equity index, but scores low on street connectivity, below the level of 0.500. This means that poor street connectivity has the same impact on Bangkok's prosperity that high inequality has on Cape Town's and Medellin's prosperity.

The negative impact of inequalities on prosperity is much more visible in the case of Johannesburg, which has a relatively well developed street network but suffers from high inequalities. This suggests that very high inequality can reverse all gains made on the other components of prosperity. Beijing, like many Chinese cities such as Shanghai, suffers from high levels of outdoor population (measured by PM10) that lower its CPI level. Considering the role of good street connectivity in reducing the use of motorized means of transport, improvement of street connectivity in Beijing can contribute to higher environmental sustainability. Due to their poor performance in street connectivity, Auckland and Moscow rank alongside the group of cities from middle- income countries, such as Beijing. This is a clear indication that poor street connectivity can hamper efforts towards true prosperity.

Reclaiming streets as public spaces

Today, People are reclaiming their streets as public spaces. The desire to have livable or complete streets is present in many corners of the world. However, for streets to be livable or complete they must first be recognized as public spaces. As noted by the Project for Public Spaces (PPS), the first rule is to "think of streets as public spaces".^{xxxii} Once streets are recognized as public spaces, they can be planned and designed to serve communities and continue to ease mobility to enhance economic productivity as well as social engagement.

ⁱ Lusher et al, 2008 (livable streets); Toronto Centre for Active Transportation, 2012 (complete streets); Finn and McElhanney, 2012 (Complete streets); Smart Growth America and National Complete Streets Coalition, 2010 (Complete streets); Svensson,, 2004 (street for all); Central London Partnership, 2003(Quality streets)

ⁱⁱ Appleyard and Lyntell, 1977; Moudon, 1986.

ⁱⁱⁱ "Every Tuesday for a whole year, a young architect named Jan Gehl sat in Strøget and recorded everything that took place around him. It was 1962, and Copenhagen's main shopping street had recently been closed off to cars – a move so controversial that the then-mayor received death threats and had to be protected by bodyguards."(Beacom, 2012) ; Copenhagen Portal (undated); City of Melbourne and Gehl Architects, 2004.

^{iv} Jacobs, 1961; Jacobs, 1970; Jacobs, 2002; Among the pioneers of Livable street are environmental design researchers such as Whyte W. (1980) and Appleyard, D. (1981)

^v Finn and McElhaney, 2012

^{vi} Toronto Centre for Active Transportation, 2012

^{vii} ARTISTS, 2004.

^{viii} The call for “pedestrianization” streets was expressed since the early 1950s in Europe and early 1960 in the United States. The Pedestrian street movement preceded livable and complete street movement. (see Moudon, 1986). The main goal was to reduce the negative impact of cars on quality of life with cars occupying most of the street area. As noted by Moudon, in New York, 85% of street area is occupied by car, and this despite the high proportion of land allocated to street.

^{ix} Complete streets is largely an engineering policy that “ensures that transportation planners and engineers consistently design and operate the entire roadway with all users in mind — including bicyclists, public transportation vehicles and riders, and pedestrians of all ages and abilities.” (Toth, 2011; Smart Growth America, 2010b).

^x Lusher et al, 2008.

^{xi} Bosselman et al, 1999.

^{xii} Lusher et al, 2008.

^{xiii} Lehigh Valley Planning Commission, 2011.

^{xiv} ARTISTS, 2004

^{xv} See: Dahl, R. (2004); World Health Organization (2004); Pucher, J., N., et al., 2007.

^{xvi} UN-Habitat, 2011.

^{xvii} Frank, L.D. et al., 2010.

^{xviii} Frank, L.D. et al., 2010.

^{xix} UN-Habitat, 2012a

^{xx} Peponis et al., 2007.

^{xxi} Nabil MOHAREB and Robert KRONENBURGARAB, 2012. WALLED CITIES: investigating peripheral patterns in historic Cairo, Damascus, Alexandria, and Tripoli. PAPER REF # 8002 - Proceedings: Eighth International Space Syntax Symposium Edited by M. Greene, J. Reyes and A. Castro. Santiago de Chile: PUC, 2012.

^{xxii} Harris D., 2011

^{xxiii} Harris D., 2011

^{xxiv} Harris D., 2011. The implementation of an orthogonal plan in Dakar was not a new practice, but a typical urban planning approach in other French colonial settlements in Africa and elsewhere in the eighteenth and nineteenth centuries.

^{xxv} Sanou, 1990 quoted by Antoine and Mboup, 1992.

^{xxvi} Antoine and Mboup, 1992; Sanou, 1990;

^{xxvii} Warah, R. Dirios, M and Osman, I. *Mogadishu Then and Now: A Pictorial Tribute to Africa's Most Wounded City*, AuthorHouse USA, 2012.

^{xxviii} Slums, according to UN-Habitat, are composed of households that lack i of improved water, adequate sanitation, durable housing and sufficient living area

^{xxix} Caution is in order here as urbanization rates and trends in different regions are, of course, largely affected by the formal definition of what constitutes a “city” or “urban area” in every country, which in turn seriously affects comparability across regions and countries. What constitutes an urban area differs from one country to another. For example, in Uganda, a settlement with a population of more than 2,000 is classified as urban, whereas in Nigeria and Mauritius the benchmark is 10 times higher; in China, those settlements with more than 3,000 residents are considered “urban”, while only those with 60,000 or more are “cities”. Urban areas are also typically defined by the administrative and legislative functions they serve, further complicating the designation of urban settlements.

^{xxx} Figures of 2010 are from UNDESA, 2012.

^{xxx1} UN-Habitat, 2010.

^{xxxii} Not so long ago, this idea was considered preposterous in many communities. “Public space” meant parks and little else. Transit stops were simply places to wait. Streets had been surrendered to traffic for so long that we forgot they could be public spaces. Now we are slowly getting away from this narrow perception of streets as conduits for cars and beginning to think of streets as places. (Toth, 2011.)