HABITAT III POLICY PAPER

9 – URBAN SERVICES AND TECHNOLOGY

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The composition of the Policy Unit 9 can be consulted at www.habitat3.org

EXECUTIVE SUMMARY

Urban services and mobility are key to inclusive, safe, resilient and sustainable cities and human settlements

The New Urban Agenda needs to make concrete recommendations for cities and human settlements to become inclusive, safe, resilient, and sustainable by including access for all to adequate, safe, affordable, accessible and sustainable basic services and infrastructure. This requires particular attention to the most vulnerable groups in society, such as the urban poor, women, children, older people and those with disabilities. Urban services like water, energy, waste treatment and transport are vital enablers for social and economic development opportunities and are thus key to achieving the Agenda 2030 and the Sustainable Development Goals (SDGs). Hence, access to these services ought to be a basic human right.

Over the coming decades, services and infrastructure for transport, water, sanitation, waste management and energy have to be provided for a rapidly growing urban population. Global urban growth poses enormous challenges, in particular with regard to greenhouse gas emissions, social exclusion, safety and air quality. This requires a transition towards more sustainable, safe and inclusive provision of urban services. Providing access to urban amenities, transport has a key role to play in this. Furthermore, with greater vulnerability to various types of risks, there is more need to improve the resilience of all service-providing infrastructures. Finally, equal access to basic services for all groups and communities should be available, with the emphasis on affordability and safe environments where basic services can be enjoyed for all, especially for the most vulnerable and those dependent on these services for living a decent life. Services and access to amenities are not merely the provision of infrastructure but also boosting efficiency, embracing local innovation and grassroot initiatives.

Technology solutions must be fit for purpose to contribute to equality and access to urban services for all, including vulnerable groups. The advancement of Smart City concepts and the high pace of ICT becoming nested within the urban sphere both call for further yet careful integration into infrastructure and service polices under the conditions of inclusiveness, safety, resilience and sustainability, while taking into account the distinctive governance and innovation dynamics of urban services and infrastructure. Resilience may be improved by developing adaptive systems and networks, including decentralised ones facilitating the self-sufficiency of municipalities and communities.

Towards new modes of governance - Time for concerted action

A human-centred, inclusive and multi-level governance approach, integrated urban development, applying the principle of subsidiarity and appropriate legislative frameworks and enforcement mechanisms are critical to the delivery of urban services and ensure coordinated action. To support this, intra- and inter-city learning and capacity building can help to leapfrog to sustainable solutions.

International efforts to implement the New Urban Agenda need to focus on all levels of governance and decision-making to ensure that multilateral and bilateral organisations, local authorities as well as national governments conform to and adopt the Urban Agenda. Thus the New Urban Agenda should respond to the following key messages.

Key messages on Urban Services and Technologies

1. Access for all
2. Cities have the responsibility to provide adequate, sustainable and resilient urban infrastructure and services to all. These refer to both high quality living conditions – through services such as safe water supply, waste management and electricity – and to facilitating convenient and equal, non-discriminatory access to urban opportunities like jobs, education, healthcare and public spaces through transport systems and mobility services. To supply these services, local authorities need funding stability and predictability as well as appropriate policy and planning capabilities. This requires support by national governments and the international community.

Efficient use

Efficient and effective use of urban services require local and national policies that support people to reduce the consumption of finite resources and shift demand toward sustainable options, including reducing water, waste, energy use, and demand for private motorised travel. Local and national governments should prioritise dense urban development and employ the most appropriate policy and technology options to support sustainable choices for services, consumption and mobility.

Local leadership

Local authorities should take responsibility and leadership for inclusive well-being and the sustainability of cities. To do so effectively, they need to engage and develop alliances with the relevant stakeholders at local, national, and international level.

National policies and funding support

National governments need to enable local authorities to provide adequate services to urban population. This includes frameworks for the funding of the development and operation of services and the ability for local authorities to associate and coordinate beyond city boundaries.

INTRODUCTION

Urban services like water, electricity and heat, waste treatment and transport are vital enablers for social and economic development and thus key to achieving the SDGs. Access to these services should be regarded as a basic human right.

This paper outlines findings of Policy Unit 9 on Urban Services and Technologies based on the contribution of an international team and comments from governments and international and civil society organisations. It focuses on the main policy challenges, criteria for priorities and actions for implementation to be included in the New Urban Agenda. It explores the key actors for implementation and elaborates on the policy design, implementation and monitoring of Urban Services and Technologies in the New Urban Agenda.

The New Urban Agenda builds on the Habitat II Agenda, which included the human right to adequate housing and water, and the corresponding obligations of states and governments. Transport plays a key role in the urban context as it provides access to jobs, goods, social and cultural exchanges, health services and education. Planning and operation of urban services and transport should ensure an adequate level of mobility to ensure the functioning of cities for all inhabitants. Implementation strategies for urban services need to consider different regional and socio-economic conditions, local administration and management, regulatory frameworks and applicability of technological solutions. Accessibility is crucial for the vulnerable population as it is a key factor for providing equal opportunities in the urban environment.

Urban services are major ingredients for the provision of chances for a self-determined life in urban areas. This applies to urban residents as well as all other users of urban services, whether for economic or social interaction, education, health or tourism purposes.

Emphasising equal access and inclusiveness is vital for poverty alleviation and the generation of social and economic opportunities for all. In the spatial sense and for the purpose of the preparation of a policy paper for the Habitat III New Urban Agenda Urban Services and Technologies are oriented towards urban areas. This does not imply any spatial limitation to municipal boundaries but covers the urban-rural nexus, the interchange of people, services, tasks and needs. To take sustainable decisions on urban services, it is necessary to promote equal opportunities for all sexes in their diversity and use this as an opportunity for targeted action.

1 VISION AND FRAMEWORK OF THE POLICY PAPER'S CONTRIBUTION TO THE NEW URBAN AGENDA

The New Urban Agenda needs to outline concrete steps for cities and urban agglomerations to deliver on a number of major global targets and frameworks, notably Agenda 2030, the Addis Ababa Action Agenda, the Sendai Framework for Disaster Risk Reduction and the Paris Agreement.

1.1 Moving on from Habitat II

The Habitat II Agenda provides the foundation for the New Urban Agenda by stating that "science and technology have a crucial role in shaping sustainable human settlements and sustaining the ecosystems they depend upon". It highlights that "the lack of adequate basic services, a key component of shelter, exerts a heavy toll on human health, productivity and the quality of life, particularly for people living in poverty in urban and rural areas". It identifies the related actions for Governments at appropriate levels to promote provisioning for adequate and affordable basic infrastructure and services.

Related to the transformative agenda for sustainable transport, Habitat II Agenda Partners committed to "improving access to work, goods, services and amenities, inter alia, by promoting effective and environmentally sound, accessible, quieter and more energy-efficient transportation systems and by promoting spatial development patterns and communications policies that reduce transport demand, promoting measures, as appropriate, so that the polluter bears the cost of pollution, taking into account special needs and requirements of developing countries". In spite of all progress during the last 20 years, this still holds.

1.2 Urban services delivering on Sustainable Development Goals and the Paris Agreement

The New Urban Agenda is key to delivering on the Agenda 2030 with all Sustainable Development Goals (SDGs) and the Paris Agreement. Equally relevant from an urban services perspective is the Addis Ababa Action Agenda regarding a framework for financing relevant infrastructure and the Sendai Framework for Disaster Risk Reduction to ensure that this infrastructure is resilient.

The New Urban Agenda closes the gap between the overarching frameworks and their concrete reference to a dimension for implementation: It provides the physical and geographical reference to these frameworks – urban areas stretching far beyond municipal boundaries and constituting an urban-rural nexus. It also provides the social, economic and environmental rationale – access, equality and the provision of development opportunities to all urban beneficiaries, both city dwellers and all other users of urban areas, regardless of their reasons for staying in urban areas, e.g. economic exchange, administration, education, health, visits and tourism.

The New Urban Agenda will be integral to the success of the SDG framework given the cornerstone role for cities in achieving the goals. **Goal 11 Sustainable Cities and Communities** refers directly to cities, recognising their role as global economy powerhouses, drivers of innovation and centres of social interaction, making urban agglomerations indispensable in reaching the global ambitions encapsulated by the other SDGs.

This builds on the Rio+20 document, which recognises the contribution of "water and sanitation within the three dimensions of sustainable development" and of the "importance of integrating water in sustainable development". The emergence of pollution control and wastewater management is part of the agreement. The Rio+20 outcome document also recognises that transportation was central to sustainable development. It stresses the development of energy efficient, multi-modal and public

transport systems and the importance of integrated policymaking at national, regional and local levels.

The Conference of the Parties in 2015 (COP 21) achieved a remarkable consensus on climate action. The Paris Agreement shows a clear attribution of the role of cities and their specific contributions to implementing and measuring action. Ambitious steps are required to limit global warming to less than 2° C above pre-industrial levels. Cities are crucial in this context. A number of initiatives have been launched such as the Urban Electric Mobility Initiative (UEMI), the Global Fuel Economy Initiative, the Green Freight Action Plan, the Global Energy Efficiency Accelerator Platform, the Business Alliance for Water and Climate and commitments by the International Association of Public Transport (UITP) and the International Union of Railways (UIC) to demonstrate that action is being taken. Cities have a wide range of opportunities to contribute to such initiatives to boost local climate action.

1.3 2030 Vision for Urban Services and Technologies

The above overview of the existing framework firmly links the 2030 vision for our planet with the role of Urban Services and Technologies in the New Urban Agenda. The relevance of urban areas in achieving the SDGs has been widely acknowledged. The interlinkages between all relevant sectors as energy, transport, water, sanitation and waste management services have been strengthened. Integrated approaches of policies, programmes and plans have become a prerequisite for funding. Implementation on the ground constantly seeks to achieve synergy effects among the urban services and transport sectors. Wherever possible, services are delivered at local level. Smart City concepts are in line with integrated and sustainable development. Smart technologies are not considered as an end in itself, but enablers to adequately deliver urban services and infrastructure to the urban population. Technical norms and standards fully comply with the SDGs and do not determine political decision making. They allow governments at all levels to decide on investment priorities, the bias being not on technological innovations but on benefiting the urban population. The New Urban Agenda provides space for the urban areas in the world to define their sustainability and level of technological "smartness" according to their legitimate yet individual principles of governance and government which shall best decide how cities want to develop in a sustainable way and improve their economic and environmental situation and their financial abilities.

Urban services take into account the increasing level of digitisation and optimally use available knowledge, data and "smart" technologies as far as this contributes to serving the urban population and maintaining or achieving an equal and fair distribution of resources. Open access to information and data is crucial to democratising technical contents of political decisions. Open access to information and data is crucial to democratising technical contents of political decisions. Gender responsive urban investments are planned and implemented with due consideration to gender dimensions and adequately addressing women's infrastructure needs, priorities and preferences.

a. Water, energy and resources

- Everyone in urban areas has access to basic services, urban infrastructure and transport. Basic services, urban infrastructures, transport, and accessibility for everyone are recognised as the key triggers for people's development opportunities and a sustainable development of urban areas. Everyone has access to basic services, economic and employment opportunities, educational and health amenities in urban areas, without any discrimination.
- Basic services need to be resilient, reliable and of appropriate quality, which cannot be provided by public authorities free of charge in the case of profit-oriented and greenfield developments of

private developers and proprietors. Local authorities are fully mandated to collect investment contributions and fees to cover the full infrastructure and service costs. Mechanisms for cross-subsidising of basic infrastructure have been introduced.

- Energy for industries and households in urban areas is largely generated and supplied through renewable resources and distributed via a grid, allowing for a minimal losses and high efficiency rates.
- The focus is always first on reducing energy use and then using the energy most efficiently. Global, national, regional and local actions encourage non-fossil fuelled urban services, delivery and transportation.

b. Transport, mobility and access to urban opportunities

- The quality of life in urban areas has improved significantly and cities play their role as catalyst of innovation by efficiently and smoothly linking people to places and activities.
- All citizens have access to public spaces and services, economic, employment and educational opportunities and health services in urban areas, without discrimination.
- Urban transport supports overall sustainability objectives through the delivery of resource-efficient, space-efficient, people-oriented, operational, clean and safe mobility, which adds to the quality of public spaces; negative externalities, such as congestion and GHG emissions, and fatalities or injuries due to urban traffic are minimised.
- Sustainable transport infrastructure and services are adequately funded through contributions from users and indirect beneficiaries.
- Urban areas are well connected with each other and with rural areas. Mobility is organised at the level of the metropolitan areas, beyond the administrative boundaries of cities, through adequate collaboration between relevant entities.

2 POLICY CHALLENGES

Cities now account for more than half of the planet's people, with 30% of all city dwellers living in slums. By 2050, urban populations are projected to increase to 6.3 billion (WWAP 2012). Developing countries account for 93% of global urbanisation (UN-Habitat 2010). Global gross domestic product (GDP) increased at an average of 3.5% per year from 1960 to 2012 (World Economics, 2014), and much of this growth came at a significant social and environment cost. During this period, urbanisation and economic growth, together with increases in production and consumption, generated increasing demands for urban infrastructure. (United Nations World Water Development Report 2015, WWDR 2015)

2.1. States and trends of the thematic areas covered

a. Water, energy and resources

Water and sanitation

A quarter of the global population live in developing countries that face water shortages due to weak governance, deficiencies of professional capacities and a lack of infrastructure for water transport and treatment (WWAP 2015). Almost a fifth of the world´s population (1.2 billion people) live in areas with physical water scarcity (UN-Water/FAO, 2007). 748 million people lack access to an improved drinking water source, while 1.8 billion people are without safe drinking water (WHO 2014, pg. 1). In 2012, 2.5 billion people had no access to an improved sanitation facility. One billion people do not use any sanitation facility, defecating instead in the open (SDG 2015); consequences for water and health are severe. By 2050, global water demand is projected to increase by 55%, driven mainly by manufacturing, thermal electricity generation and domestic use (WWAP 2015). Increased demand for water can indicate positive economic growth but also implies huge challenges in allocating scarce water between and within industry, agriculture and the minor but yet decisive share of domestic water use. Increased water demand often marginalises the poor population and excludes it from safe water accessibility.

The convergence of climate change and growing economic development in least developed countries is to intensify the water insecurity of the poor. The OECD (2012) estimates that by 2050, water demand from manufacturing industries and thermal power generation will increase dramatically, especially in developing countries and the BRICS. In the manufacturing industry alone, the total share of water demand by 2050 is expected to increase from 7% to 22% (WWAP 2015). In spite of outstanding advances in water provision in the last decades, over 80% of wastewater worldwide is not collected or treated, and urban areas are the main source of pollution. 90% of all wastewater in developing countries is discharged untreated directly into rivers, lakes or the oceans, causing environmental and health risks. (WWDR 2015)

Energy and energy efficiency

Over 1.3 billion people lack access to electricity, and roughly 2.6 billion use solid fuels for cooking (IEA, 2012 in WWDR 2014, pg. 13). Another estimated 400 million people rely on coal for cooking and heating purposes, causing air pollution and creating serious health implications when coal is used in traditional stoves (WWDR 2014, pg. 13). Global energy consumption increased by 31 % from 2000-2013 (IEA 2015). Household energy consumption increased by 18 % (IEA 2013). The share of household energy consumption varies between regions; in OECD countries and Asia, housing represents 20-30 % of the

total energy consumption whereas in Africa the share of household energy consumption is 56 %, in the Middle East 17 % and in Latin America 15 % (IEA 2013). In all regions, the absolute energy consumption of households has increased; the increase is very modest in OECD and Middle East countries. The major share of global energy production is generated from fossil sources, and the share of renewables has not increased globally in the last 13 years (IEA 2015). CO_2 emissions have increased 47% over the same period (IEA 2013).

Global power generation continues to be dominated by thermal electricity production from coal, natural gas and nuclear energy production. The share of renewables is expected to double, accounting for 30% of all electricity production by 2035 (IEA 2013). Wind and solar PV make up just 3% of the global power mix. Although they are expected to grow rapidly over the next decades, they will probably not represent much more than 10% of global electricity generation by 2035, not enough to achieve the climate goals (IEA 2012).

Waste and resources

The amount of municipal solid waste (MSW), one of the most important by-products of an urban lifestyle, is growing even faster than the rate of urbanisation. In 2000, 2.9 billion urban residents were generating about 0.64 kg of MSW per person per day (0.68 billion tons per year). More than 1.3 billion tons of municipal solid waste was estimated to have been generated in 2012. By 2025, 4.3 billion urban residents are likely to generate about 1.42 kg/capita/day of municipal solid waste (2.2 billion tons per year, all The World Bank 2013). To this globally about a third of food produced for human consumption needs to be added due to its loss or waste, which amounts to around 1.3 billion tons per year (UNEP 2013, pg. 13).

In developing countries, municipalities tend to spend 20-50 % of their available recurrent budget on solid waste management (The World Bank 2011). 30-60 % of all urban solid waste in developing countries is uncollected and less than half of the population is served (The World Bank 2011). In developing and emerging countries, collection coverage can be as low as around 40%, compared to 98% for developed countries (UNEP 2013). The global waste market, from collection to recycling, is estimated at US$410 billion a year, excluding the huge informal segment in developing countries (UNEP 2011, pg. 290). Recycling a ton of aluminium saves 1.3 ton of bauxite residues, 15 m^3 of cooling water, 0.86 m^3 of process water and 37 barrels of oil, which prevents the emission of 2 tons of carbon dioxide and 11 kg of sulphur dioxide (UNEP 2013, pg. 13).

3.5 billion people, or half the world's population, have no access to waste management services, and open dumping remains the most widespread waste-disposal method in most low and lower middle-income countries (UNEP 2013, pg. 13). A ton of electrical and electronic waste (e-waste) contains as much gold as 5-15 tons of typical gold ore, and several times the amounts of copper, aluminium and rare metals found in typical ores (UNEP 2013, pg. 13). Globally, organic waste decay contributes 5% of greenhouse gases. Waste is a major economic drain, especially on city budgets: frequently, half of a city's budget is spent on waste management (UNEP 2013, pg. 8).

b. Transport, mobility and access to urban opportunities

In contrast to the vision highlighted above, the current situation in many urban areas is far from ideal. In a significant number of cases, the mobility situation hinders sustainable growth and the quality of life of urban populations. Some of the issues are identified below, while the following subsection will look at the institutional and policy inconsistencies that have led to this state of affairs.

- Developing and transition economies will see the bulk of population growth, with urban populations in Africa and Asia projected to rise by 90% by 2050. This will cause mobility demand to triple and place even more acute pressure on the current infrastructure and services in these countries.
- Transport policies implemented in the past, as well as urban planning and infrastructure, led to an automobile dependence lock-in, with many destinations in or around cities requiring travelling for longer distances, making them reachable primarily, if not solely, by car. This has led to an imbalance in the use of different transport modes: private motorised modes of transport are dominant in developed economies and absorb an extremely high proportion of energy in comparison to their transport effects. The number of daily car trips in urban areas worldwide is set to increase substantially if no action is taken: from 3.5 billion trips in 2005 to 6.2 billion in 2025.[i]
- While the appeal of private cars for urban populations in developed economies is starting to wane, urban areas in developing and transition economies increasingly embark in the trajectory of car dependency. This would not only impact developing and transition economies but have a strong global impact, notably in terms of resource consumption, greenhouse gas emissions, congestion and road risk. Fossil fuelled transport needs to be drastically downscaled in favour of sustainable transport modes for passengers and goods.
- Cities are increasingly confronted with levels of traffic congestion, offsetting the benefits of agglomerations and negatively impacting their attractiveness and competitiveness, as well as citizens' wellbeing. In the European Union, the 2011 White Paper on Transport estimated the cost of road traffic congestion at nearly 100 billion euro annually, approximately 1% of total EU GDP in 2010. It is very useful to note the disproportionately high cost this is putting on the economic value produced in the urban area itself, particularly in developing cities. A 2014 study estimated that losses due to congestion in the metropolitan areas of Sao Paulo and Rio de Janeiro alone have reached a billion Brazilian real, 8% of the GDP produced in the two areas. The settlement structure, increasingly characterised by urban sprawl, creates unnecessary traffic. However, cities in developed countries are starting to reverse the sprawling trend.
- Motorcycles and mopeds are taken up as a regular means of transport, particularly in developing countries, as an alternative to private car use. However, they add further externalities to urban transport, decreasing the quality of life in urban areas, primarily due to additional pollution (both noise and air quality) and higher levels of road risks.
- Disadvantaged groups within the urban population, particularly the poor, cannot take full advantage of the urban opportunities and services – including public spaces, health, education, meaningful employment – as the distances and costs associated with urban travel restrict their full access and participation. Social inequalities become sharper instead of being attenuated.
- Policies prioritising the use of private vehicles limit the potential to improve the quality of urban life and promote social interactions. In these cases, urban mobility has negative effects on quality of life and the overall livelihood in the city. Poor quality of urban life has many aspects, including unacceptably high risks: 380,000 road deaths were recorded in urban areas in 2005. Roads are primarily designed for car use without taking into account the needs of vulnerable road users. The World Health Organization states that 90% of the total number of road deaths occur in developing countries, where most of the urban growth is expected: road safety needs to improve by fostering safe behaviour of road users, infrastructural improvements and promoting safe vehicles. Other

externalities refer to bad air quality caused coming from tailpipe emissions, as well as noise pollution from the car engines. Furthermore, the lack of physical activity associated with using private cars as the main mode of urban travel puts a high burden on healthcare systems.[ii]

- The current pattern of vehicle use in cities is inefficient, in terms of both passenger and goods transport. Public transport vehicles are under-utilised at off-peak times, leading to high service provision costs. On the other hand, private vehicles are parked about 95% of the time, and when they are moving, the average occupancy rate of private cars – usually having 4 seats – is well below 2 passengers per car. Technological innovations and better data on transport demand and supply can improve these inefficiencies. The development of the sharing economy, combined with the digitalisation of urban mobility, offers an opportunity to reduce car ownership and use vehicle capacity in a more efficient way.

2.2. Policy issues and challenges

The overarching challenge for Urban Services and Technologies is to apply a participatory approach in the form of inclusive partnerships at different levels of government and among the relevant stakeholders and the public. Further key challenges lie in fostering growth and overall development whilst guaranteeing equal access for all urban beneficiaries to urban services and transport.

All relevant sectors tend to claim a dominant role (water, waste management, energy, transport, etc.). The challenge lies in establishing a joint understanding of integrated sustainable urban development showing the sectorial interdependencies and providing for priority setting and the mobilisation of synergies amongst the sectors. Sectorial approaches need to recognise that the "win" for the one predominantly means a "loss" for the other, i.e. optimising water supply for one area often implies a lack of basic supply for another, mechanising waste management means marginalising the informal waste sector, optimisation of traffic standards lowers the quality of public space, etc.. This highlights the need for integrated and cross-sectorial approaches for urban services and mobility.

Investments for urban services need to consider and understand the investment rate of technological and innovative solutions and bring them in line with the requirement to serve all urban beneficiaries. The resilient design and implementation of urban infrastructure requires weighing and decisions on the dilemma whether to opt for more flexible, "robust" low-tech structures that can easily be repaired or re-established after disasters or technologically more sophisticated infrastructures with a higher level of redundancy to sustain disasters.

In this context, international and national norms and standards also pose a relevant challenge: The setting of standards and norms through the International Organization for Standardization ISO and other norming institutions (IEC on electro-technology, ITU for telecommunication) under the umbrella of the WSC (World Standards Cooperation) has an enormous influx on investment patterns of public administrations and the private sector. In the context of the New Urban Agenda, this plays a vital role as most of the investments in urban services are subject to technical or even non-technical standards.

Provision of urban infrastructure and services, especially in greenfield development, is commonly not based on a full or even part cost recovery, absorbing local government resources that would be better allocated to service provision for the urban poor.

Conventional finance mechanisms and financial resources are insufficient to meet the costs of establishing and extending urban infrastructure and basic services. This also holds for the operation and

maintenance of facilities. Proper transfer through transparent, accountable and legally sound procurement and delivery processes requires a global consensus on transparency, sound procurement procedures and quantitative and qualitative controls on delivery patterns.

Often, the transfer of tasks related to urban services to the responsibility of local authorities (principle of subsidiarity) does not go hand in hand with the simultaneous transfer of political mandates, administrative structures, financial resources and room for local decision-making. Common to all areas of the provision of urban infrastructure, basic services and transport is the frequently inefficient use of available resources. The challenge is to carefully integrate sectors, take into account life-cycle costs and sustain investments in areas with the best effects on accessibility for all urban beneficiaries, social inclusiveness and technological appropriateness.

Often, gender-responsive urban investments are not designed and implemented according to gender dimensions and adequately addressing women´s infrastructure needs, priorities and references. Within this scenario, it is also necessary to recognize the increasing incorporation of women into the labor market and the lack of investment and mechanisms for adequate security on public transport as a measure against harassment and sexual violence in transport.

Policy issues and challenges refer to the visions above. To achieve them, the following challenges have to be dealt with:

a. Water, energy and resources

- The investment gap towards basic water, sanitation services and energy supply (construction of basic infrastructure) urgently needs to be bridged.
- Although renewables are increasing in proportion to conventional energy, they remain underdeveloped and under-subsidised in comparison to fossil fuels (WWAP 2014). The production and distribution of energy tends to be highly centralised, also in areas with obvious opportunities for delivery and improvement through decentralised schemes based on renewables.
- Reducing the demand for both materials and energy while enhancing access to household energy among the urban poor is a major challenge.

b. Transport, mobility and access to urban opportunities

The issues highlighted above are primarily the result of a number of structural policy elements, notably inconsistencies between policies at different levels, which lower the quality of urban life and access opportunities available to urban populations:

- While the main goal of urban mobility policies is to provide access to opportunities and amenities, there is no systemic perspective on urban mobility. Transport and land use planning, environmental or urban economic development policies are usually not interconnected and coordinated, despite local authorities generally being responsible for these policies.
- In a number of countries, competence for planning and procuring urban mobility services has been devolved to the local level, but without sufficient funds being allocated or the competence to raise or decide on funding being devolved simultaneously.
- While promoting public transport use, decreasing congestion or improving air quality often are priorities at the local level, the user costs of private motorised transport modes do not reflect their

full costs, notably due to the widespread subsidisation of fuel prices, which is decided at the national level. Conversely, while social protection and equality may be a priority of national level policies, practices related to urban development and planning at local level may sometimes create or perpetuate social inequalities (e.g. lack of adequate access to amenities or service provision in poorer neighbourhoods).

- The necessary appraisal of transport projects and options is complicated by the lack of assessment frameworks (ex-ante, ex-post) and the difficulty and cost of collecting relevant data. In some cases, projects are pursued according to political or individual preferences, rather being guided by an evidence-based assessment of their benefits in terms of access to urban populations.
- The benefits of providing access to urban opportunities through sustainable transport means are difficult to estimate and quantify. As such, both public authorities and private entities tend to view sustainable transport of goods and passengers as a cost rather than an investment.

3 PRIORITISING POLICY OPTIONS – TRANSFORMATIVE ACTIONS FOR THE NEW URBAN AGENDA

3.1 Targets

Targets should be interlinked with the adopted SDGs, COP 21 goals, the outcomes of international conferences and national policy setting. In addition targets also need to reflect the ambitions linked with the expansion of urban services and the improvement of urban transport towards better urban environments and living. Ambitious targets as: full coverage of urban areas by urban services which comply with basic standards up to the end of the decade, halt of open waste dumping sites within five years' time, urban transport's GHG emissions reduced by 50 % in ten years' time etc. To ensure effective implementation, these targets should be aligned at the local, national and global level and should be backed by broad consensus. Ambitious targets can set the direction of current and future action, and are useful to show governmental commitment and to send a clear message to the market.

a. Linkages between the thematic areas covered and the SDGs

The links between the SDGs agreed at global level and the New Urban Agenda highlight the role envisioned for Urban Services, Mobility and Technologies in fulfilling them. These links show the interconnectedness between global goals and the urban fabric and the role urban services play in making the most of this relationship. The NUA should recognise that the SDGs' urban dimension is much broader than Goal 11. SDG 11 - Make cities and human settlements inclusive, safe, resilient, and sustainable targets other SDGs. In particular, SDG 3 Health, SDG 5 Gender, SDG 6 Water, SDG 9 Infrastructure, SDG 13 Climate, and SDG 17 Implementation are strongly linked to Goal 11 (Habitat Unit/TU Berlin 2015). Urban services can make a substantial contribution to sustainable development, reducing poverty, improving health, equality, protecting the environment, biodiversity, combating climate change and improving the quality of life in our cities. However, unsustainable transport can significantly impact on many of the Sustainable Development Goals, too. This is vital to consider in planning urban services systems.

b. Linkages between the thematic areas covered and results of COP 21 Goals

The COP 21 agreement aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty. This requires keeping the increase in global average temperatures to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognising that this would significantly reduce the risks and impacts of climate change. The decarbonisation of the energy and transport sectors has a vital role to play. It needs to be pursued closely not only in view of the objectives set on access to safe, affordable, accessible and sustainable urban development but also to add the contribution of the urban sector to the climate objectives and the related decarbonisation to mitigate further climate change. Finance will play a vital role here, and the Green Climate Fund and the Addis Ababa Action Agenda have a key role to play in this context, which also includes enabling cities to directly access international, multilateral and bilateral climate finance and development cooperation funding sources.

c. Linkages between the thematic areas covered and results of Habitat II

Habitat II emphasised the need to combat the deterioration of living conditions within human settlements, which is needed to address unsustainable consumption and production patterns; population changes, including changes in structure and distribution, considering the tendency towards

excessive population concentration. Furthermore, the lack of basic infrastructure and services and adequate planning, growing insecurity and violence, environmental degradation, and increased vulnerability to disasters need to be addressed.

HABITAT II also strengthened to extend adequate infrastructure, public services and employment opportunities to rural areas in order to enhance their attractiveness, develop an integrated network of settlements and minimize rural-to-urban migration. Habitat II promoted full accessibility for people with disabilities, as well as gender equality in policies, programmes and projects for shelter and sustainable human settlements development.

d. Criteria

In keeping with the vision of urban services and transport that was expressed in Section 1, the following values and criteria have to be kept in mind when designing and implementing urban mobility policies.

- A key criterion for the selection of policy priorities relates to striking a balance between individual and collective goals. From an urban services and transport point of view, most of the policies previously adopted have favoured individual goals over collective goals.
- Sustainable growth should be at the core of urban service and mobility policy. Sustainability can foster the streamlining of policies to provide better urban services and more public transport using clean fuel technologies. Furthermore, as discussed above, urban services and transport should act as a lever for growth, and policy-makers should ensure that sustainable urban services and mobility also leads to economic growth.
- Equity and affordability should be observed in all service- and mobility-related policies, because access to urban opportunities should be provided equitably. This criterion is particularly salient in the wider context of favouring social integration and inclusion, and it is important to note that good urban services and public transport connections strongly favour the development and improvement of the human capital within cities.
- A key criteria for a balanced and integrated approach to deliver on the SDGs and climate targets is to mobilise stakeholders and resources for all urban services, strengthen the administrative structures through capacity-building and develop workable governance structures to boost implementation action.
- Decentralisation is the prerequisite to deliver urban services applying the principle of subsidiarity, giving responsibilities and resources to the appropriate level of government, putting cities and municipalities at the heart of urban service delivery. Investment decisions can then be based on criteria such as equality, fit-for-purpose service delivery, resilience, the generation of economic and social opportunities and cost-recovery considerations.

3.2 Policy priorities

Based on these overarching targets, policy priorities arise to deliver the stated objectives. The following policy priorities refer to visions and challenges above.

a. Water, energy and resources

Water and sanitation

Urban water services (water supply, drainage, and wastewater) need to be developed to match the natural resources and soil available in order to provide a sustainable service. Water services demand should be matched with the natural risks, resource availability and protection through choices made in urban design of buildings and neighbourhood (cascading uses of water, rainwater harvesting, grey water recycling, wastewater collection and treatment, etc.) which shape the urban form. Once basic infrastructure is supplied and operational, water and sanitation systems need to be developed towards full operational cost recovery but taking into account the social impacts of their pricing.

In order to avoid waste of water and an unequal distribution of water resources, pricing systems incentivising the efficient use of water in the agro and mining industry need to be introduced which reflect the water footprint.

Energy supply and energy efficiency

Energy efficiency and access to renewable energy sources needs to be achieved with a focus on the synergy of various areas. The key objective is the decarbonisation of energy production, distribution and consumption. Central and de-centralised energy systems should be integrated, and two-way energy networks should be efficiently used. When more fluctuating power supply is increasing (solar, wind), it is extremely important to ensure efficient demand side measures and smart control systems. In addition, long and short-term energy storages are gaining significance.

It is essential to manage the transition to sustainable energy supply and delivery. The challenge lies in managing the increasing energy demand while enhancing access to household energy among the poor at the same time.

Waste and resources

Access to de-centralised waste management systems needs to be provided, and alternatives to unregulated and inappropriate forms and locations of unregulated disposal of waste (open burning, landfilling without groundwater protection) must be pursued.

Waste needs to be treated as a resource, and “circular economy” mechanisms have to be established. Decent work among a formalised waste collection and recycling system and informal waste workers and recyclers, ensuring a coherent, efficient and dignified system for waste collection, recycling and disposal are a prerequisite for the acceptance of a coherent waste policy.

b. Transport, mobility and access to urban opportunities

Starting from the criteria given above, the following priorities should be set in terms of urban design and access to city opportunities and services.

Compact, dense and inclusive urban design, mixed land use, as well as the integration of transport and land use planning, should be promoted. The goal should be to reduce the distances travelled to enjoy and take advantage of urban opportunities. This includes controlling and reversing urban sprawl and prioritising urban development in areas already served by public transport services. Wherever new urbanization is to be implemented, the concept should include public transport and non-motorised mobility.

The quantity, quality and integration of sustainable transport options in urban areas should be improved. This includes three different elements:

- Investment in infrastructure dedicated to public transport services, walking and cycling and other

upcoming forms of moving as well as improving facilities for non-motorised travel modes;

- The promotion of a more efficient use of existing infrastructure, exploiting the potential of digitalisation of urban mobility as well as shared mobility;
- Improving sustainable travel options, making the travel experience by collective and public transport modes a seamless alternative to private car travel.

The demand for private motorised travel should be managed and urban transport rebalanced in favour of people rather than vehicles. Priority should be given to sustainable travel modes which reduce the cost of transport for the community and the negative externalities of urban transport.

A resilient and predictable mix of funding sources for sustainable urban travel should be achieved. Efforts should be taken to better internalise the costs of various modes of urban transport, and revenues directed towards sustainable modes. Infrastructure investments should also prioritise sustainable travel in the attempt to de-carbonise urban transport.

3.3 Critical recommendations for implementing the urban agenda

A New Urban Agenda requires policies, programs, projects and measures to be taken in a systematic multi-layer approach interlinking activities of governments, regions and the local level. A range of measures need to be regarded as a prerequisite for change. In addition, a variety of immediate activities are needed to generate a "momentum of change" with some "quick wins". This also encourages all related parties to enter the "Agenda of Change" as early as possible.

A range of cross-sectorial recommendations prove valid for all sectors. Out of these, one administrative issue appears to be relevant: Inter-municipal cooperation and shared services offer an alternative full service delivery by one municipality through the division of responsibilities and task sharing. Inter-municipal cooperation can work as an arrangement between two or more local governments and support the provision of urban services and transport, gain substantial advantages through the economies of scale or solve problems the cities and their hinterland have in common.

The following section provides additional sector specific recommendations.

a. Water, energy and resources

Water and sanitation

- Assess the water-related risks and resource limitations and maximise the advantages of the natural environment prior to planning the city development, so that the limitations may be accommodated, the natural potential best valorised and risks mitigated, while synergies with other sectors are implemented for maximum efficiencies;
- Launch an integrated water planning approach to manage urban-rural linkages, minimise conflicts and ecological disasters as well as to maximise positive synergies and mutual benefits, at local and regional scales;
- Make the best use of waters through an integrated water cycle approach, limit the resource movement, maximise its reuse by drawing it from diverse local sources, optimise its productive use (e.g. by using water at qualities that are fit for purpose), prevent pollution and treat "waste" as a resource (for energy and materials) and by fostering synergies at the water-food-energy nexus;
- Plan adaptive urban water systems with the necessary resources to build greater adaptive capacity

to respond to the inherent uncertainties associated with global change issues;

- Assure public health through strong local leadership and adequate investments in sanitation infrastructure and services, develop citywide universal sanitation access strategies and apply innovative, context-specific and culturally-sensitive solutions;

Energy supply and energy efficiency

- Promote an immediate and strong shift towards a low carbon energy system in line with a 1.5°C stabilisation pathway;
- Boost energy efficiency by optimising building-related energy consumption, improved industry processes, business and households, district cooling and efficiency through co-generation (block or district heating networks);
- Consider increasingly different energy aspects jointly, as heat and electricity supply in conjunction with mobility and waste-to-energy technologies;
- Create opportunities for developing countries to leapfrog to renewable solutions for energy storage and warming water; e.g. Solar power and local small-scale smart grids in rural areas where conventional power lines do not exist.

Waste and resources

- Take a circular economy approach, emphasising waste prevention, source separation and the use of waste and waste products;
- Facilitate urban mining and the reuse of wastes; establish material recovery facilities;
- Ensure the appropriate, transparent and prudent management of hazardous waste in line with international treatment and health standards;
- Establish extended producer responsibility schemes that include producers in the financing of urban waste management systems and reduce the hazardousness of waste streams and recycling rates by better product design;
- Develop local waste prevention concepts that take into account the specific urban metabolism and focus on the most urgent waste streams with the highest cost-saving potentials.

b. Transport, mobility and access to urban opportunities

Setting the priorities described above requires concerted action from a large number of stakeholders who are involved in urban mobility, whether directly or indirectly. This section will make recommendations, for each priority area, on how the array of stakeholders should work together to achieve these priorities.

Urban design and planning

- Local governments are one of the main institutional actors in this priority area, but they are definitely not the sole actor involved. Promoting compact, dense cities requires an urban land use plan linked with a transport plan for the city prioritising the multifunctional neighbourhoods and spaces within the city that can be reached easily through public transport.
- Local authorities must foster cooperation and provide the conditions to create a mutual

understanding between transport and urban planning departments.

- At the same time, local administrations must have the necessary knowledge and capacity to draft a transport and land use plan, and the legal capacity to enforce it upon adoption.
- In many cities, both in the developing and developed countries, basic land inventory information, such as a cadastre, is not readily available, and local administrations should have the support of the national (or regional if relevant) and international level to obtain and make good use of such data and information.
- Land use and transport plans are most effective when they are covering the most appropriate scale, also taking into account regional travel and urban-rural linkages. As such, a strong framework and culture of cooperation should be created for cities and municipalities in the same metropolitan area.
- In places where infrastructural needs are acute and the capacity for action at both local and national level is missing, international institutions (such as UN Agencies and multi-lateral development banks) also have a role to play as well.
- Yet plans set the main framework for investments in the cities. They also have to be signed up and 'appropriated' by private business and civil society to be successfully implemented. For example, to promote transit-oriented development, a fine balance needs to be struck between offering land developers incentives to develop next to high capacity lines and capturing the extra value that public transport would bring to the land itself through the agglomeration of activities around stops. Transport companies, whether incumbent operators or private ones (even if informal), should also be involved to make the best use of connections, setting up feeder services and multi-modal connection facilities needed for seamless door-to-door travel.

Increasing the quantity and quality of sustainable travel options

- Infrastructure investments in urban projects should be decided upon according to the benefits they bring to the area. For urban transport infrastructure projects, access is the key benefit, but – in accordance with the values above – the goal should be appraising the benefits in terms of access for people, rather than for vehicles. Current frameworks for appraisal should be adapted to adequately reflect the wider economic, quality of life and accessibility benefits of sustainable travel and road safety. It is important that all such projects are appraised using a common framework, and that the local authorities (who would propose the projects in question) are capable of estimating and identifying the benefits of sustainable transport infrastructure.
- Cooperation with academia is a very important aspect in the goal of raising the efficiency of the use of current infrastructure in order to increase its resilience and adaptability. As technologies often hold the key to using existing urban infrastructure more efficiently, it is important that regulators, (innovative) businesses, researchers and transport providers work in tandem to ensure that the right framework is in place to better use the transport infrastructure to attain sustainable, people-oriented urban mobility.
- Good governance and coordination, underpinned by technological solutions, is also required to improve the quality of sustainable mobility services. Starting from the assumption that mobility policy should be based on equity (as included in the criteria for priorities above), the key recommendation is that both mobility providers and regulators cooperate to provide sustainable

travel conditions and services which allow convenience and flexibility similar to what car travel has up to now. Local authorities and mobility providers in metropolitan areas must have a clear and enforceable contractual relationship defining the obligations of both parties related to requirements of service and remuneration.

Managing the demand for private motorised travel

- Setting up access restrictions or congestion charging schemes, which discourage private cars and motorcycles from entering certain neighbourhoods, helps reducing congestion, as well as sound pollution, improving air quality and reducing road risk that stem from private motorised traffic. It is paramount that accessibility to an area is also provided through sustainable modes and that any revenue from such schemes is reinvested into improving access and transport options. National governments should adapt legislation to allow the creation of restricted traffic zones within cities.
- The availability and price of parking is an important element in determining modal choice for people in urban areas. Removing minimum parking requirements for development of residential and commercial locations would reduce building costs and increase the amount of space that is available. As such, local authorities could seek out alliances with land developers and the business community in the city for such policies.
- It is also important that the goals of local and national policies are aligned to promote sustainable travel options in urban areas. In particular, subsidised fuel prices, or tax advantages for car ownership (company cars) should be abandoned.

Secure adequate funding

- As providing access to urban amenities and opportunities requires funding – both as infrastructure investments and as funding for the maintenance and operation of services – stable sources of income should be found. Clear frameworks of cooperation should be put in place to ensure that while local authorities are being given responsibilities for the planning and provision of services, they also have a matching ability to raise the required finances to actually deliver. Furthermore, local governments should maintain open and transparent avenues of dialogue with local businesses, which benefit when cities are more accessible. As indirect beneficiaries of sustainable mobility, the latter should also be involved in providing a share of the funding for sustainable mobility services in metropolitan areas.

4 KEY ACTORS FOR ACTIONS – ENABLING INSTITUTIONS

This section will build upon the critical recommendations highlighted in Section 3.2 by mapping out the players and stakeholders who would ideally be involved in the policy-making process. Furthermore, the envisioned links, relations and interactions between the actors in order to transform policy priorities and outcomes successfully will be highlighted. While the stakeholders will be mentioned as a list starting from the highest to the lowest level of aggregation, the relations between them should not be hierarchical but cooperative and based as much as possible on an equal footing.

4.1 Public administration

National governments

- National governments should recognise that urban areas represent the powerbases of national competitiveness, productivity and growth. The higher quality of life that provides the availability of urban services such as water, energy and waste management attract urban populations, concentrating the potential for growth in cities; as such, national governments should enable local administrations to provide these in a sustainable fashion, using technology to address resource finiteness. Furthermore, national governments should work with city representatives to ensure that urban mobility policies serve their purpose of unleashing this development growth potential and identify ways in which obstacles to productivity and economic development – such as traffic congestion, lack of accessibility and high road risks – can be removed.
- The role of national governments is critical in providing funding, as is a critical appraisal of projects and strategies that require major investments. This includes both investments in services that improve the quality of living conditions in cities (provision of energy, water and sanitation and waste management) and those providing access to urban opportunities (sustainable transport infrastructure and services).
- National governments should recognise the intrinsic link between the spatial layout and geography of urban areas and access urban populations have to opportunities within cities. In doing so, they should support the integration of land use planning and transport policies at local level. Setting up and maintaining a land use inventory, which local authorities can access, is an important prerequisite.
- National governments should – in cooperation with international institutions if needed – set up a national urban infrastructure funds with the express goal of enabling cities to work towards reaching target 11.2 of the SDGs. Eligibility for such funding should be linked with the implementation of integrated urban development strategies (such as Sustainable Urban Mobility Plans), and the decision on disbursing and approving the funding should follow an appraisal procedure taking common elements into account.
- Cooperation between national and local level governments should take place in a well-defined framework considering the potential to create value that the provision of urban services and transport projects bears for private businesses in urban areas. Cities should be allowed to capture a share of this value and mandated to reinvest it into urban services to improve the quality of life within the area.

- Additionally, through their fiscal and regulatory powers, national governments have a key role in shaping the scene for urban services and mobility policies. National legislation should clearly set the way in which urban services and mobility policies are being defined. Legislation deciding on the powers, responsibilities and funding streams available to local authorities that manage service delivery and mobility in urban areas is needed to offer clarity and set the rules of the game for local-level governments.
- Fiscal policies and taxation, for which national governments have nearly exclusive authority, are important levers for shaping the construction, operation and maintenance of urban services and transport in urban areas. Taxation and subsidies from the national level should focus on promoting sustainable urban services and mobility, while also lowering the costs per capita of urban services and transport.
- In this respect, national and local governments should coordinate to align their urban services (for example by jointly defining minimum service standards) and transport policy goals (for example by complementing travel demand management policies at local level by reducing any fuel subsidies or reducing incentives for companies to offer company cars). Having signed up to the ambitious SDGs and targets, national governments should cooperate with other stakeholders to reduce the level of energy consumption and carbon footprint of urban mobility systems.

Regional and local governments and authorities

- Local governments are key to improving urban services and transport. To foster public policies in public services and transport delivery and in view of the increasing technical and financial constraints, policy dialogue and continuous collaboration amongst all levels, with the private sector and the communities, needs to be initiated by regional or local governments as they have the responsibility to serve the urban beneficiaries. The dialogue incorporates key stakeholders (central governments, service operators, trade unions, civil society) and can result in drawing up charters defining roles and responsibilities, financing and management and minimum standards to set qualitative and quantitative levels and standards of urban services and transport in line with the sustainability goals.
- To contribute to strengthening urban services and transport, the effectiveness of regional and local government departments and public providers must be improved by investing in human and technical resources and implementing appropriate management systems and technologies.
- When urban services and transport provision is entrusted to external partners, regional and local governments should be active and demanding partners in order to ensure universal access to services and preserve public goods. They need to develop and maintain the internal capacity to monitor and provide oversight to ensure that access, quality and tariffs meet the needs of citizens. For many cities, this requires a collaborative approach with other cities to upgrade their capacities and promote these tasks.
- Local governments should acknowledge the role played by small-scale and informal operators in basic service and transport provision and promote co-production of basic services with local communities, particularly in informal settlements and slums. They should assume responsibility for monitoring quality, harmonising prices and coordinating service delivery with official providers to avoid provision gaps.

- Local governments should be aware of the potential impact of new urban infrastructure on the preservation of cultural heritage, cultural practices and symbols. Cultural impact assessment tools should be used to carry out an ex-ante analysis of potential negative impacts, and a precautionary principle should apply whenever necessary.
- The urban-rural and urban-urban interlinkages in all fields of urban services and transport highlight the importance of coordination between local governments in the same metropolitan area or region. The successful design and implementation of strategic infrastructure and mobility policies at metropolitan or regional level requires a good level of cooperation between local governments as well as with national governments.
- Furthermore, local governments are best placed to integrate urban infrastructure and mobility with other local policies and objectives, particularly housing and land use policies. Decisions on housing, building permits and zoning regulations will strongly affect the provision of urban services, mobility and transport in the city, so it is paramount that the relevant departments coordinate their actions and policy goals.

4.2 Stakeholders

Operating companies, urban services and mobility providers

- Due to their practical expertise, companies providing urban services and transport services to urban residents should be involved in the policy-making process regarding transport policies. Furthermore, given their direct relation with customers, such companies are familiar with consumption and travel behaviour and preferences, which can be fed into policy-making processes.
- On the other hand, public authorities and not the private sector, particularly at the local level, should strive to formalise organised transport within metropolitan areas by setting standards and guidelines that professionalise the sector and improve travel across the city.

Stakeholders, beneficiaries and civil society

- Urban service and mobility policies, programmes and plans need to be developed in close collaboration with stakeholders, beneficiaries and civil society. Without the integration of bottom-up aspirations and demands policies, programmes and plans tend to remain fragments. Making investments in urban services and mobility amongst the urban population a success requires a broad consensus on the rationale, goals, objectives and means.
- Civil society groups and various associations play an important role in shaping and influencing consumption pattern (water, waste, energy) and travel behaviour, and can consequently support authorities in reaching their goals, particularly on moving towards sustainable consumption patterns and travel modes.

Private developers, the business community, and service providers

- Private developers for real estate can add to the value of urban services provided they pay for the urban services rendered based on a full cost recovery or add to the urban infrastructure in line with the quality standards set by the local bodies. On the other hand, private developers may not escape with windfall profits from increasing land prices and real estate development in the formal and informal housing economy without contributing to urban services and public amenities.

- The business community has a lot to gain from adequate urban infrastructure and efficient urban mobility services as better services, connectivity and transport links enable businesses to gain access to a wider and more diverse workforce, offering better productivity.
- Additionally, as transport amounts to lower transport costs for the community (as a share of the GDP produced within the urban area) in cities less dependent on private car travel,[iii] businesses stand to gain from the higher purchasing power of the urban residents. The business community should cooperate with authorities at both national and local levels to reinforce this virtuous circle and participate in the funding of inclusive, equitable and sustainable urban mobility projects. Moreover, as improved public transport connections offer more opportunities for residents to access urban services, the value of land and buildings in well-connected areas increases. Businesses stand to gain from this increase in the physical capital within the city and should be encouraged to support public transport projects[iv].
- Privately organised service providers play a decisive complementary role to the public sector if they operate efficiently and in line with clear-cut performance and delivery standards. These need to comply with the overarching objectives set at the different government levels. They need to be monitored closely and are obliged to report to their public clients.
- Businesses are more likely than public authorities to be among the early adopters of new technologies that could improve the quality and efficiency of urban services. Through cooperation and engagement with the research community as well as authorities, businesses in the metropolitan areas can act as 'test-beds' for technologies before they are rolled out at city level.

Housing agencies and cooperatives

- Housing agencies and cooperatives can cater for a considerable proportion of urban housing needs primarily for the lower income groups while also being partners in the provision of urban services, their (co-)financing, management and operation. Cooperatives often play a role in the transport sector and can be part of a multi-modal urban transport policy. They are usually highly adaptive to changing needs and requirements and can complement the public transport services.
- Cooperatives can also contribute to waste management as an intermediary between formalised public or private waste services and the informal sector. They are ideal means to maintain a high job-rate in the waste sector and have proved highly flexible and efficient in adapting to waste management requirements if properly integrated into the waste management economy.

4.3 International community and academia

International community, multilateral banks, city networks and institutions

- International institutions play a key role in helping actors at both national and local levels build capacity and knowledge to identify and implement strategic urban services and transport projects. Capacity building is also relevant from a governance point of view, and international institutions can offer assistance in the building of institutions that facilitate good cooperation between local actors.
- They also provide support in the setting of the policy agenda for national governments and other stakeholders. Furthermore, they are well placed to gather, analyse and disseminate knowledge of policy options and trends from all over the world. The role of international institutions is essential in identifying good practice examples at urban as well as national level.

- Through their inclusive and participatory structures, international institutions can act to facilitate the exchange of knowledge. The knowledge should be linked to capacity building. From their position of gathering knowledge, international institutions are also in a good position to observe where knowledge gaps exist, and should be working with the stakeholders involved to develop the capacities needed to fill these gaps.
- The measurement and appraisal of urban services and mobility outcomes is an area where international institutions should cooperate more with both governmental actors – at national and local level – and with civil society, academia and the business community to develop this capacity. At the same time, international-level actors and institutions can also work with governments and authorities at national and local levels to help the latter set up a workable framework for the sharing of responsibilities and competences regarding urban services and mobility, particularly related to funding arrangements. International institutions also play an important role in mobilising private funding for urban services and mobility projects, and can foster cooperation between governmental actors and civil society and academia for the successful design and implementation of urban mobility strategies.
- In addition to the International Financial Institutions, such as multilateral development banks, have a key role in financing, providing technical cooperation and advising national, regional and governments in urban mobility matters.
- International, regional and national city networks play a key role in designing, requesting and supporting frameworks for effective and sustainable urban services.

Academia

- Apart from their general role in improving the skills and qualifications of the (future) workforce, thus improving human capital available within cities, universities provide unique knowledge in terms of generating knowledge related to the appraisal of the outcomes of urban services and mobility policies and strategies.
- Academia has a central role in providing and fostering innovation, which can be applied or implemented directly. Innovation should not be limited to technical or engineering aspects. Innovation in e.g. organisational and governance fields as well as marketing can be beneficial for both transport and other urban services. Private and public actors should take advantage of, and foster good relations with, the research community.

5 POLICY DESIGN, IMPLEMENTATION AND MONITORING

The derivations from the vision, challenges and priorities should become the basis for the monitoring of design and implementation of the key actions that anchors the new urban agenda on Urban Services and Technologies.

5.1 Policy design, governance and technologies

The realisation that urbanisation represents a unique opportunity to be harnessed to support economic growth and social advancement has grown in the last decades. This makes it more imperative to acknowledge the diversities in the urban sphere and ensure that governance, planning, design and implementation for urban services are driven by multi-level governance, decentralised local governance, and inclusive, accountable, participatory and people-centred principles.

Decentralised policies could provide expanded mandates and resources to local governments. However, the gap between allocated responsibilities and the capacities to implement the policies must be aligned to local revenue generation. This is a huge challenge for their credibility towards their citizens.

Achieving good governance requires that local government, civil society and all stakeholders involved in knowledge, industry, technology and finance are given equal opportunities at the same decision-making level for their cities. Appropriate legislations, regulations and policies as well as enforcement mechanisms are relevant to anchor and sustain inclusivity, participatory decision making and collective monitoring and evaluation of city development.

The New Urban Agenda framework has to focus on technologies, since it is a crucial element of urban infrastructures and offers many opportunities. The availability of (digital and physical) infrastructure and the use of big data is important for the future development of cities and their ability to cope with challenges. As new infrastructure technologies evolve and become increasingly inter-linked, their co-evolution needs to be considered holistically if cities are to fully optimise the overall benefits of innovative urban infrastructure systems.[v]

In this context international standardization as a crucial condition for scaling and replication can contribute to strengthening the possibilities for the utilization of technology for urban challenges. Standardization should be set up in such a way that it sustainably guarantees competition among multiple vendors and systems. Therefore, it should be defined to create open infrastructures or open ecosystems. Standards should focus on technologies and not behavioural patterns. They need to be developed together with all stakeholders relevant for the delivery of urban services contributing to inclusive, safe, resilient and sustainable cities and human settlements.

Policy learning in a triple helix context approach between science, industry and government is vital. Urban infrastructure and technology demand cooperation amongst various stakeholders. Next to government, civil-society, private organisations and individuals must be given equal opportunity to develop and apply smart solutions and this involves access to information for all. Experimenting with and learning from the social possibilities of new technologies through a ‘learning by doing’ approach and urban living labs is also required.

Smart city concepts can provide inputs into effective urban services and provision. However, since cities are unique, a careful integration of the smart city concepts into integrated urban development concepts is required to assure that technology supports people and is fit for purpose. This may be guided by an

active exchange between cities to avoid mistakes and replicate success.

5.2 Implementation and finance

Clearly defined financial mechanisms should facilitate local authorities' access to financial resources, attract domestic and foreign direct investment, establish and improve revenue generation and collection systems at sub-national level, and engage in a transparent and productive way with the private sector. The need to develop and implement monitoring and evaluation mechanisms to monitor progress and document impacts of spatial plans should also be highlighted.

Support should be provided to local authorities in developing coherent and implementable urban management tools and parameters (i.e. spatial plans, regulations) in order to provide the territorial framework within which governance tax and fee collection, infrastructure provision, environmental management and service provision are prioritised and implemented. This includes expanding and updating the information of the local authorities' cadastre.

In addition, progressive tax systems must be introduced to finance infrastructure outside development grants/tax revenues. This ensures a good tariff and structured/tiered rates determined by the quality of the services or the product provided.

National urban infrastructure and transport funds

Urban infrastructure funds based on a diversity of funding sources should be developed at the national level. This could include contributions from international funding institutions as well as earmarked revenues from dedicated taxes. Different models could be envisaged for such funds, ranging from grants to public to leverage for contributions from other public entities and the private sector.

Eligibility criteria for the funds could include the following:

- prioritisation of integrated urban strategies including urban development, housing and public transport; this helps hedge the risks linked to individual projects;
- integrated in reflection at national level on development potential and balance between different cities and regions;
- subject to appraisal procedures set out at national level;
- appraisal based on integration within a sustainable urban transport plan.

Generation of funding for infrastructure and services at local level

Frameworks should be developed at national level allowing local authorities to perceive taxes and charges related to value created by investment in transport schemes. In parallel, capacity should be built to provide local governments with adequate tools to capture such value.

Partnership should be developed between players at local level to support the acceptability of the measures.

5.3 Monitoring

Monitoring of progress in implementing sustainable urban services policies and infrastructures can help guide and redirect local decisions and share experiences with the global community. The main elements for the monitoring of Urban Services and Technologies are focusing the various urban services sectors.

The selection of indicators should build on the upcoming indicator set for the Sustainable Development Goals provided this is developed with local authorities associations and city representatives adequately involved.

Data in support of urban infrastructure and transport policies

Data are required to support policy design, setting of targets, and appraisal and monitoring of implementation. Regarding in particular appraisal, only reliable data should be measured that account for the wider benefits of investments in urban infrastructures and services.

Capacity building should be provided for the identification and measurement of adequate input, output and outcome indicators which reflect the reliability of data in its specific national or local context. Appropriate procedures should be developed at local level for collection, management and sharing of data. Analytical frameworks should be established at national/international level for comparisons of data between cities.

6 CONCLUSION

An urbanising world and the crucial role of urban services and infrastructure

Urban services are fundamental to human living for all people, in all cities and settlements of the world. In many places, adequate, safe, affordable, accessible and sustainable basic services and infrastructures for all are yet to be realised. The provision of the whole range of urban services remains the driver for social and economic development and the well-being of the urban population, in particular to the most vulnerable, such as the urban poor, women, children, older people and those with disabilities. The urban world becomes highly differentiated; high technology applications and inadequately low provision of basic services take place at the same time and often physically side by side.

Serious disparities prevail between the developed and the developing world regarding the level of service provisioning in general and across groups and communities in particular, especially in Africa. Even in developed countries, the development and/or maintenance of safe, healthy, resilient and sustainable infrastructures is still a major task. Access to urban services is linked to the Sustainable Development Goals and the ambitious goals for climate change mitigation formulated at the COP21 conference.

Global urbanisation urgently calls for basic service delivery and infrastructure development as core themes for the New Urban Agenda. In cities, nearly 1 billion slum dwellers are deprived of all basic services, especially in African cities, while urban infrastructure has yet to be constructed for 3.5 billion people. Crucial to this is the rapid development of appropriate policy, governance and funding frameworks. The delivery of services needs to go in line with efficient operation and maintenance practices. The smart use of fast advancing technologies, especially ICT technologies, can help in this respect.

In order to boost the implementation of the New Urban Agenda in the area of Urban Services and Technologies, governance structures are needed that give clear responsibilities to different levels of government, and encourage active participation and engagement of all stakeholders, including citizens and the private sector.

Key actions for each level of government

To achieve inclusive, safe, resilient and sustainable human habitats based on adequate urban services, the different stakeholders need to undertake key actions.

National level

- National governments need to provide the mandate and the means to local governments to deliver urban services.
- Key national policies that are required include fiscal policies (e.g. energy and fuel taxation), minimum standards for basic services, water safety and recycling, regulation for efficiency, and procurement frameworks.
- The provision of funding from national level goes along with conditionalities and appraisal of projects and strategies that require major investments.

Regional and local governments and authorities

- Local governments are key to improving urban services and transport. They need to set political priorities and ensure that infrastructure, technology and policies deliver on those priorities. For this to be effective, strong local leadership is needed with a clear vision and support from local businesses and citizens.
- Local governments are best placed to establish integrated urban development plans, which bring infrastructure and mobility in line with other local policies and objectives, particularly housing and land use policies. It is essential that the relevant departments coordinate their actions and policy goals. In doing so they can better match demand with ability to deliver services to all.

International institutions

- International Funding Institutions have a key role to play to support local action and to leverage further funding.
- International agencies play a key role in facilitating knowledge exchange and providing capacity building. This can include for institutions building, policy and infrastructure development, needs assessment and measurement of impacts.

It is necessary to reach a collective agreement on the role of sustainable urbanisation within a wider agenda of sustainable development. This cannot be achieved if levels of government act in isolation. They need to adopt a systemic approach on multi-level governance, ensuring that policy priorities are in line and actions are mutually reinforcing in delivering on the New Urban Agenda.

APPENDIX I

HABITAT III Policy Paper Framework – PU 9 Urban Services and Technologies

PU9 - HABITAT III
POLICY PAPER FRAM

APPENDIX II: CASE STUDIES

This annex brings together a selection of case studies in the thematic areas covered by the Habitat III Policy Unit 9. Given the interdisciplinarity of several of these case studies, there are many overlaps with themes of other Policy Units. Several of these case studies come from the case study series of the Connective Cities project.

Annex
II_Case_Studies_exa

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