Policies for Sustainable Accessibility and Mobility in Urban Areas of Africa

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO

SSATP
Africa Transport
Policy Program

Working Paper No. 106

The SSATP is an international partnership to facilitate policy development and related capacity building in the transport sector in Africa.

Sound policies lead to safe, reliable, and cost-effective transport, freeing people to lift themselves out of poverty and helping countries to compete internationally.

* * * * * * *

The SSATP is a partnership of
40 African countries: Angola, Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Democratic Republic of the Congo, Côte d'Ivoire, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe
8 Regional Economic Communities:
2 African institutions: UNECA, AU/NEPAD
Financing partners for the Second Development Plan: European Commission (main donor), Austria, France, Norway, Sweden, United Kingdom, Islamic Development Bank, African Development Bank, and World Bank (host)
Many public and private national and regional organizations

* * * * * * *

The SSATP gratefully acknowledges the contributions and support of member countries and its partners.

* * * * * * *

This paper is a product of the SSATP. The findings, interpretations, and conclusions expressed herein do not necessarily reflect the views of the SSATP or the World Bank. The SSATP does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of the SSATP or the World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

© January 2015 The International Bank for Reconstruction and Development / The World Bank Group
1818 H Street, NW Washington D.C 20433 USA.

The text of this publication may be reproduced in whole or in part and in any form for educational or nonprofit issues, without special permission provided acknowledgement of the source is made. Requests for permission to reproduce portions for resale or commercial purposes should be sent to the SSATP Program Manager at the address above. The SSATP encourages dissemination of its work and normally gives permission promptly. The Program Manager would appreciate receiving a copy of the document that uses this publication for its source sent in care of the address above.

Photo credit: istockphoto - Western Freeway Leading into Durban City Centre (South Africa)

Table of Contents

Acknowledgements vii

Acronyms ix

Executive Summary xiii

1. Introduction 1

Purpose of this policy paper 1
Methodology and structure of the document 3
Key concepts used in the paper 4

2. Accessibility and mobility in urban areas of Africa: Current state, emerging trends and key issues 7

Overview 7
Key issues related to urban transport governance 9
Key issues related to urban transport governance 10
Key issues related to urban transport systems 16
Key issues related to the impacts of urban transport 21

3. Lessons from international experience in improving mobility and accessibility 25

Improving the governance framework 26
Making the transport systems more efficient 32
Mitigating the negative impacts and externalities of transport 39
Overcoming common barriers to sustainable urban accessibility and mobility 43

4. Policy recommendations to achieve sustainable accessibility and mobility in urban areas of Africa 45

Framing the vision 45
"EASI" 46
Enable 49
Avoid 59
Shift 63
Improve 74
Where to start 79

5. Conclusion 83

Annexes **85**

Annex 1. Summary of EASI policy recommendations 85
Annex 2. City typology indices development 87
Bibliography 97

Acknowledgements

This paper was produced under a task managed by Camilla Lema, SSATP thematic leader for the Theme 2 of the SSATP Second Development Plan (2009-2015): sustainable institutional and financial arrangements for road infrastructure and rural and urban transport services. To broaden the scope of the analysis of mobility and accessibility issues in Africa, the Swiss Secretariat of Economic Affairs complemented the financing initially provided by the SSATP. The paper was produced under the guidance of Jean-Charles Crochet, Sr. Transport Specialist at the World Bank; Mattia Celio, Programme Manager at the Swiss State Secretariat of Economic Affairs; and Roger Gorham, Transport Economist at the World Bank. It was reviewed by Jean-Noel Guillossou, SSATP Program Manager, and edited by Monique Desthuis-Francis, SSATP Publications Officer. The paper was prepared by a team led by Martin Stucki (Transitec Consulting Engineers) in collaboration with Delphine Albrecht (Transitec Consulting Engineers), Laila Mokhlisse (Transitec Consulting Engineers), Margarida Neta (Transitec Consulting Engineers), Jorge Vargas (Transitec Consulting Engineers), Nico McLachlan (ODA), Roger Behrens (UCT-ACET), Sean Cooke (UCT-ACET), Julien Allaire (CODATU), Pablo Salazar-Ferro (CODATU), Rafaa Mraihi (CODATU), Dorothy McCormick (University of Nairobi), David A. Mfinanga (University of Dar es salaam) and Jean Granjux (Urbaplan). The paper was the subject of several rounds of reviews and consultations organized within the World Bank and with stakeholders in and outside Africa. The team is grateful for all the comments received from reviewers and participants in various workshops and events. The paper was published by Inje Oueslati, SSATP Program Assistant.

Acronyms

ADB	Asian Development Bank
ADP	*Villes en Développement – Association de Professionnels*
AFD	French Development Agency
AfDB	African Development Bank
AGETU	*Agence des transports urbains d'Abidjan*
AICD	Africa Infrastructure Country Diagnostic
AIKP	Africa Infrastructure Knowledge Program
AU	African Union
BMZ	German Federal Ministry for Economic Cooperation and Development
BRT	Bus rapid transit
CETUD	Dakar Executive Urban Transport Council
CMI	Center for Mediterranean Integration
CODATU	Cooperation for Urban Mobility in the Developing World
COTS	Commercial off-the-shelf system
EASI	Enable, Avoid, Shift and Improve Conceptual Framework
EIB	European Investment Bank
GART	Association of Transport Authorities
GIS	Geographic Information System

GIZ	*Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH*
GTZ	*Deutsche Gesellschaft für Technische Zusammenarbeit*
ICCT	International Council on Clean Transportation
ICT	Information and Communications Technology
LRT	Light rail transit
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MOT	Ministry of Transport
MTRC	Mass Transit Railway Corporation
NAMA	Nationally Appropriate Mitigation Actions
NEPAD	New Partnership for Africa's Development
NMT	Non-motorized transport
NSO	National statistical office
NSS	National statistical system
OECD	Organization for Economic Co-operation and Development
PIDA	Program Infrastructure Development for Africa
SDG	Sustainable Development Goal
SECO	Swiss Confederation, State Secretariat for Economic Affairs
Sida	Swedish International Cooperation Agency
SLoCaT	Partnership on Sustainable Low Carbon Transport
SSA	Sub-Saharan Africa

SSATP	Africa Transport Policy Program
SUMA	Sustainable Urban Mobility in Asia
TSDMS	Transport Sector Data Management System
UATP	African Association of Public Transport
UCLG	United Cities and Local Governments
UITP	International Association of Public Transport
UNACLA	United Nations Advisory Committee of Local Authorities
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environmental Programme
UN Habitat	United Nations Human Settlements Programme
URB-AL	Regional cooperation programme involving sub-national governments of the EU and Latin America
UTP	Union of Public Transport and Rail

Executive Summary

Addressed to policy- and decision-makers, this paper proposes a set of policies which aim to improve accessibility and mobility in urban areas of Africa.

Large and small, urban areas of Africa are currently experiencing the fastest population growth in the history of the planet. As a result, policy- and decision-makers face enormous challenges in meeting the needs of current and future urban dwellers.

Drawing from specific data collection and analysis for selected cities in Africa, as well as from insights gained through consultations with stakeholders and through an extensive literature review, this paper:

- Gives the reader an overview of the main accessibility and mobility issues faced by African urban areas, namely stemming from benchmark analysis among representative urban areas selected across the continent;
- Provides the reader with an overview of the lessons stemming from international experience over the past twenty years; and
- Proposes a conceptual framework and a set of policy recommendations meant to improve accessibility and mobility conditions in urban areas of Africa.

As a first step, the diagnosis is structured around ten specific and interrelated key issues that bear on accessibility and mobility in urban Africa, namely:

- four key issues related to urban transport governance: organization, human resources, financing, and land use.
- three key issues related to the urban transport system itself: public space, transport services, and transport infrastructure.

- three key issues related to the main impacts and externalities of urban transport: road safety, environmental quality and resources, and travel cost and time for users (i.a. affordability and inclusiveness).

In brief, the current situation can be summarized as follows:

- Cities in North and Southern Africa present a more positive profile on governance and urban transport system issues/indicators than do most cities in West, Central and East Africa. In certain North and Southern African cities, a few mass transit systems have been implemented, many years ago in the case of Tunis and Cairo, more recently in Gauteng, Rabat-Salé and Casablanca. New initiatives are now developing in West and East Africa learning from these past experiences including the success of the Bus Rapid Transit system in Lagos, Nigeria.
- For most cities, little progress can be observed with respect to integrated land-use planning and control, suggesting that urban growth will remain a strong threat to efficient mobility and sustainable urban development for some time.
- Control over the transport system is relatively weak. However, positive trends and improvements are observed in certain agglomerations, e.g. in Rabat-Salé, Casablanca, Ouagadougou, Addis Ababa, Kumasi and Cape Town.
- Limited availability of public transport services, in the form of scheduled bus and or rail services, is a concern in almost all of the case cities. Trends in respect of improvement of the supply of scheduled public transport service are negative in nine cities, while seven cities are actively implementing improvements.
- Infrastructure design, operations and maintenance is a concern. A negative trend is observed for a third of the selected urban areas, mostly in cities where the trend for public transport services is also negative.
- While some progress with respect to urban road safety can be seen in cities such as Addis Ababa, the Gauteng city region and Cape Town, the cities included in the study generally display poor levels of regulation and correspondingly poor traffic law enforcement.
- A very limited number of cities in Africa monitor air pollution or have carried out source apportionment studies. So while there is anecdotal evidence that air quality degradation is a major concern in African cities, and

transport appears to be an important contributor, there is little quantitative evidence at the present time.

On this basis, it appears clearly that both the performance and the negative externalities of urban transport systems constitute overarching concerns in Africa. While some progress is observed or expected with respect to governance and transport systems in a minority of cases, the preconditions for sustainable improvement of urban transport systems in the selected cities do not appear to be in place. Indications are that urban mobility growth pressures will be high, and that significant improvements to urban transport governance are required.

As a second step, prior to defining recommendations, the following lessons were drawn from international experience:

- The need for an integrated vision and strong and sustained political leadership to carry through reforms;
- The ability to manage projects and to manage the complexities of the overall urban transport system;
- The ability to establish clear authority and the required coordination mechanisms to ensure the best use of available resources to serve the long term public interest;
- The need for the data and know-how to develop and implement an integrated urban vision, with specific reference to issues relating to mobility demand and transport supply;
- The need for walking to take center stage in all mobility improvements and the need for all cities to become attractive pedestrian spaces;
- The need to implement public transport services with attention to both quantity and quality of service, integrating different modes and different operators – both formal and informal – in the interest of serving all users;
- The need to build adequate infrastructure and to make the best use of the opportunities provided by such infrastructure in line with the functions and levels of priority of different modes of transport; and
- The need to reduce the negative externalities of transport systems and to increase the opportunities that can be created through greater attention to road safety, social equity, energy efficiency and economic performance of the system in whole, to the benefit of users, business, the economy and public finances in general.

It is not a surprise that the necessary and proper management of territorial accessibility and urban transport systems form a complex matter, in Africa as in all other parts of the World. This matter requires to identify and engage significant multidisciplinary and inter-sectorial means that need to be well coordinated to achieve sustainable impacts.

As a third and major step, a set of policy recommendations is formulated within a single conceptual framework for action, designed to encompass the complexity of the matter and to mobilize all stakeholders in a common direction.

Aspiring to become a powerful policy tool to improve accessibility and mobility in urban areas of Africa, the "EASI conceptual framework" integrates four levers of interventions, at the two levels of the governance system ("Enable") and the urban transport system itself ("Avoid", "Shift", "Improve"):

ENABLE: seven policy recommendations aiming to establish an efficient and responsible governance system, capable of anticipating needs, guiding action and ensuring integrated management and development of urban transport systems;

AVOID: three policy recommendations aiming to minimize the need for individual motorized travel through adequate land-use and transport planning and management;

SHIFT: five policy recommendations aiming to maintain or increase the modal shares of public transport and non-motorized transport modes such as walking and cycling;

IMPROVE: three policy recommendations aiming to improve the efficiency and safety of transport modes while minimizing their environmental footprint.

Ownership of the EASI concept and pursuit of the policy recommendations presented in this paper are meant to set African cities on the path to better mobility, better accessibility and better quality of life for all.

This paper formulates recommendations that make it possible to start implementing EASI without delay and in a very tangible way.

The need for action is strong and urgent!

1. Introduction

Purpose of this policy paper

Meant as a response to a strong and urgent need for action, this paper proposes a set of policies which aim to improve accessibility and mobility in urban areas of Africa. Building on existing data and knowledge, stakeholder consultation, field visits and benchmarking among representative urban areas of Africa, this policy paper aims to support policy- and decision-makers while preparing decisions on policies related to urban accessibility and mobility.

Africa is urbanizing at a very high pace, and both large and intermediate African cities are experiencing rapid and often unplanned growth. As a result, policy- and decision-makers face numerous challenges regarding planning, development and management of their cities.

Accessibility and mobility are central to sustainable urban development. However, most African cities display low levels of accessibility and mobility, when measured against the needs of their populations (*cf.* Box 1 on "Strong urban growth in Africa").

These cities are faced with poor urban planning, inefficient basic service delivery, poor infrastructure provision, inadequate transport services, unregulated traffic, increasing congestion and pollution, and inadequate technical, institutional and financial capacities.

Moreover, most policy- and decision-makers have not yet recognized that urban mobility requirements are significantly different from those of intercity transport; this limits their ability to respond in the best possible way to the challenges brought about by inadequate urban transport systems.

Based on growing concerns regarding mobility and accessibility in urban areas of Africa, the Africa Transport Policy Program (SSATP) commissioned this policy paper to

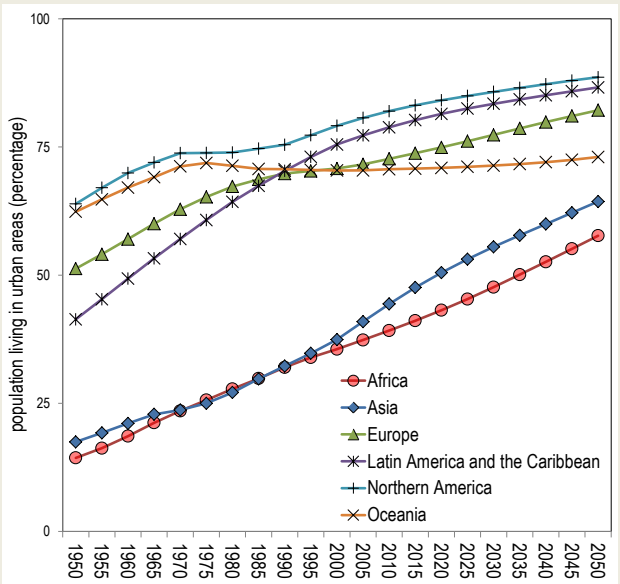
assist African policy- and decision-makers to transform their urban areas from obstacles to growth to engines of economic development and poverty alleviation.

Box 1. Strong urban growth in Africa

According to its 2011 revision of the World Urbanization Prospects, the UN Department of Economic and Social Affairs estimates that urban areas of Africa were home to about 414 million inhabitants in 2011. By 2030, this number is expected to rise to almost 750 million and by 2050, to over 1.2 billion.

The annual urban population growth rate of Africa is by far the highest in the World, with 3.09% for the 2011-2030 period, to be compared with 1.87% in Asia, 1.13% in Latin America, 0.98% in North America and 0.33% in Europe. As a result the urban share of the total African population will also increase rapidly as shown in the graph below.

Figure 1. Urban population in all regions of the World between 1950 and 2050



Source: World Urbanization Prospects, The 2011 Revision

As presented below, presently 65 % of Africa's urban population lives in urban areas of less than 1,000,000 inhabitants and 55 % in cities of less than 500,000 inhabitants. By 2025, the majority of urban dwellers will still live in urban areas of less than 1,000,000 inhabitants. This highlights the strategic opportunity in pro-actively addressing the urbanization challenges facing secondary cities.

Table 1. Urbanization in Africa in 2010 and 2025

	10 million or more		5 to 10 million		1 to 5 million		500 000 to 1 million		Fewer Than 500 000	
	2010	2025	2010	2025	2010	2025	2010	2025	2010	2025
Population (millions)	21 820	48 132	8 415	58 408	104 350	172 681	38 317	60 551	227 750	302 651
Percentage of urban population (%)	5,44 %	7,49 %	2,10 %	9,09 %	26,04 %	26,88 %	9,56 %	9,42 %	56,84 %	47,11 %
Number of agglomerations	2	3	1	9	47	81	55	91	-	-

Source: World Urbanization Prospects, The 2011 Revision)

Methodology and structure of the document

The methodology used to develop the policy presented in the paper follows five main steps:

- Gathering of data and knowledge about transport systems, mobility and accessibility conditions as well as governance frameworks in urban areas of Africa, mostly on the basis of an extended literature review, a systemic benchmarking among twenty African cities, specific field visits and consultation of local stakeholders carried out in a selection of eight urban areas, and consultations with global stakeholders (e.g. United Cities and Local Governments of Africa, African Development Bank, World Bank, African Association of Public Transport),
- Identification of key issues and current trends concerning accessibility and mobility conditions as well as concerning governance of urban transport systems in urban Africa,
- Highlighting of relevant lessons that can be learned from recent experiences made throughout the World in the field of urban transport,
- Formulation of a set of policy recommendations addressed specifically to policy- and decision-makers in charge of urban development and transport provision in urban areas of Africa, and
- Peer-review of these policy recommendations by African stakeholders and experts following international seminars organized by SSATP in Dakar in December 2013 and in Nairobi in October 2014.

This document is structured as follows:

- **Chapter 1** sets the scene for this policy paper and defines hereafter the central notions of transport, mobility and accessibility.
- **Chapter 2** provides an overview of the ten key issues facing urban areas of Africa, at the three levels of transport supply, governance framework and impacts/externalities of urban transport.
- **Chapter 3** depicts selected lessons from international experience about how these issues have been dealt with elsewhere in the World, successfully or not.
- **Chapter 4** proposes a set of policy recommendations aimed at improving accessibility and mobility in urban areas of Africa.

- **Chapter 5** concludes this document by advocating policy- and decision-makers to adopt and engage in the implementation of these recommendations without delay.

Key concepts used in the paper

This section defines three major concepts used throughout this paper namely transport, mobility and accessibility.

Transport

Transport refers to the supply system enabling people and goods to move or be moved within a defined area. Urban transport refers to such a system at the level of an urban or metropolitan area.

A transport supply system typically includes infrastructure (fixed installations), vehicles and operations; operations refer to the way in which infrastructure and vehicles are operated, as well as the enabling environment such as financing, legal frameworks and policies.

From a public authority perspective, transport supply is usually considered as a two-dimensional system, made up of transport infrastructure and transport services.

Transport infrastructure includes linear installations (such as roads, railways and waterways) and terminals (such as railway stations, bus stations and trucking terminals). Transport services include bus systems, taxi fleets and rail services.

Ownership and operation of infrastructure and services can be either in public or private hands, or both.

In this document, the following definitions are accepted:

- Public transport refers to transport services available to the public (as opposed to private transport). Public transport services can be supplied by public or private operators, with or without predetermined schedules, routes, stops, fares and subsidies. Private operators can be formal (officially recognized by the public authority) or informal, and the state of informality can in turn range from being 'illegal' and unregulated to being 'legal' and regulated.

- Paratransit refers to public transport services supplied by informal private operators running small to medium capacity vehicles (including motorcycle taxis, collective taxis, and mini-buses).
- Mass transit refers to high-capacity public transport systems, usually operated on dedicated infrastructure (railway or road based), e.g. regional trains, subways or metros, light rail transit (LRT), tramways, bus rapid transit (BRT).
- Non-motorized transport (NMT) refers to human powered modes (mostly walking and cycling); motorized private transport refers to all other private modes (e.g. motorcycle, car, pickup truck).

Mobility

Mobility refers to a group of users' ability, tendency and/or need to move, resulting in a transport demand. Mobility therefore primarily refers to the demand side of a transport system.

The use of the term 'mobility' usually highlights the pre-eminence of people over infrastructure and vehicles.

Mobility embraces concepts such as multi-modality (principle of simultaneously considering all travel modes in a complementary way) and inter-modality (principle of connecting various travel modes for consecutive use along one same trip).

Transport infrastructure and services are supposed to answer to existing and future mobility needs.

Accessibility

According to Rodrigue 2013, "Accessibility is defined as the measure of the capacity of a location to be reached by, or to reach, different locations. Therefore, the capacity and the arrangement of transport infrastructure [and services] are key elements in the determination of accessibility."

Accessibility is a central concept in this report, because the overarching aim of any sustainable urban transport policy should be to provide and improve accessibility towards and within a particular urban area. To provide efficient transport infrastructure and services is only a mean to that end, not the aim itself.

2. Accessibility and mobility in urban areas of Africa: Current state, emerging trends and key issues

Overview

To establish a global diagnosis of the current state of urban transport and mobility in Africa is an ambitious and complex endeavor, namely if one considers that:

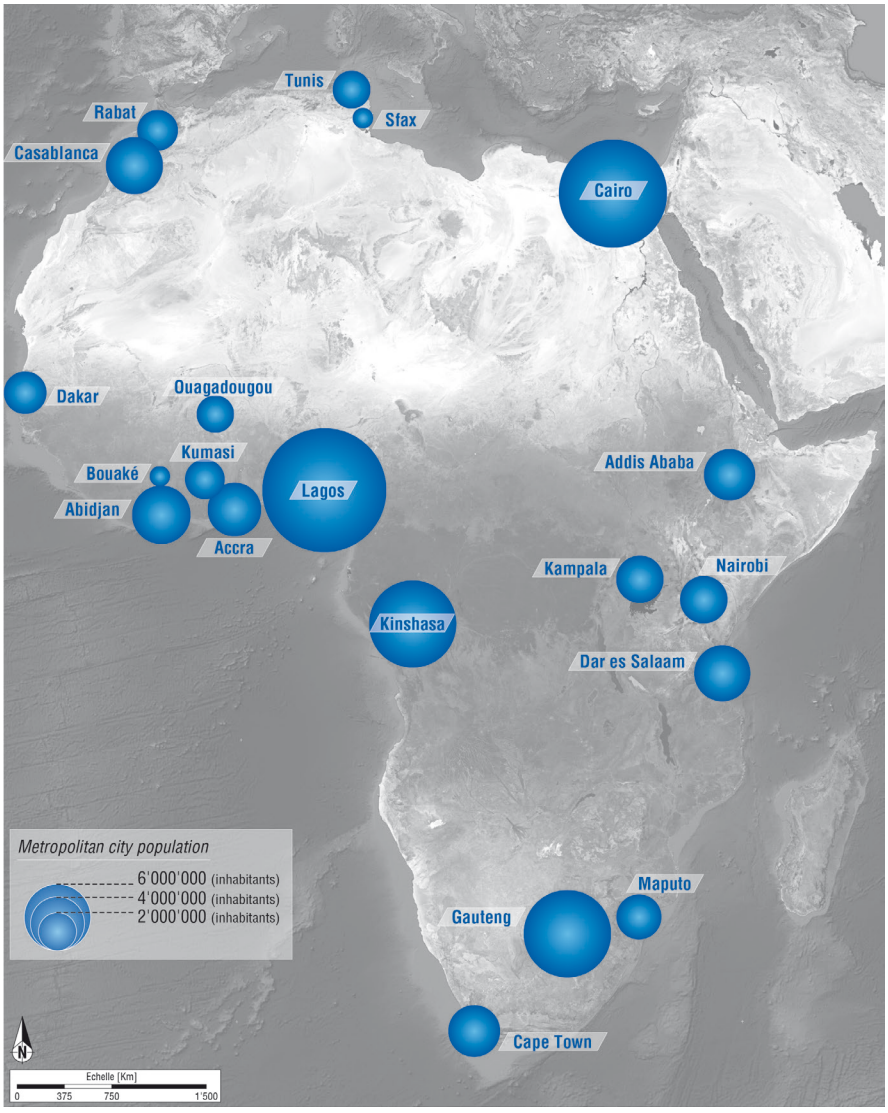
- Any urban transport system is a multi-component and dynamic system, which to be correctly assessed requires deep understanding of a broad range of dimensions and stakeholders.
- Every urban area and every urban transport system is a one-of-a-kind case, resulting from a specific combination of critical characteristics such as geographical and topographical constraints; population size, density and growth; political and economic situation; historical and cultural background, etc.
- Relevant data on urban transport supply, demand or impacts are rarely available and reliable, and when they exist for a specific urban area, differences in definition and/or collection often make it difficult to use them for direct comparison with other urban areas.

Despite this complexity, a global diagnosis is presented hereafter resulting from the methodology introduced earlier. In particular, the diagnosis relies on:

- an extended literature review, and a number of consultations with global African stakeholders,
- a systemic approach that considers not only the technical aspects of urban transport supply but also its governance framework and its main impacts,
- a benchmarking carried out on the basis of specific quantitative and qualitative data searched and gathered for a selection of twenty urban areas, depicted in the following figure, representative of the diversity of situations encountered on the African continent (synthesis reports on the investigations carried out in the twenty urban areas are available as appendix to this document), and

- field visits carried out specifically for this assignment in a selection of eight African countries to collect additional data and to meet with the main stakeholders in urban transport, both at national and local levels.

Figure 2. Map of the twenty urban areas selected for benchmark analysis at the scale of the African continent



Nota bene: the selection was made according to different urban criteria, including overpopulated and emerging urban areas as well as secondary cities, inland versus coastal/port cities, geographic coverage of Anglophone vs. Francophone and Portuguese speaking countries, including North Africa and Sub-Saharan Africa.

Essentially, ten specific key issues are identified and form the backbone of the diagnosis reported in this chapter. Presented in the illustration below, these ten key issues are grouped under the three main dimensions pertaining to any urban transport system:

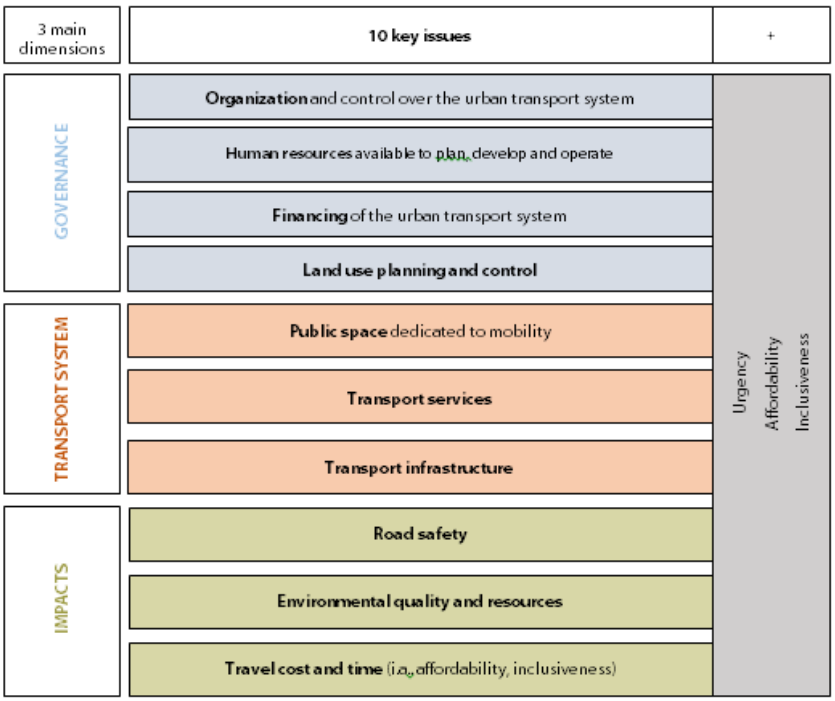
- four key issues related to urban transport governance: organization, human resources, financing, and land use.
- three key issues related to the urban transport system itself: public space, transport services, and transport infrastructure.
- three key issues related to the impacts of urban transport: road safety, environmental quality and resources, and travel cost and time for users.

The strong urban growth Africa is experiencing (cf. Box 1) represents an additional key issue that puts a particular strain on all three dimensions of the system: the urban transport system itself, its governance framework, and its main social, environmental and economic impacts and externalities.

Key issues related to urban transport governance

The table below presents an overview of the assessment made concerning key urban transport governance issues and trends in the twenty representative urban areas of Africa.

Figure 3. Ten key issues impacting on the state of accessibility and mobility in urban areas of Africa



Key issues related to urban transport governance

The table below presents an overview of the assessment made concerning key urban transport governance issues and trends in the twenty representative urban areas of Africa.

Table 2. Assessment of key urban transport governance issues for the twenty selected urban areas of Africa

System dimension	GOVERNANCE			
Key issues	Organization	Human resources	Financing	Land-use
Cairo	→	→	→	↓
Tunis	↓	↓	→	→
Sfax	↓	→	→	→
Rabat-Salé	↑	↑	↑	→
Casablanca	↑	↑	↑	→
Dakar	→	→	→	→
Ouaga.	↑	↑	→	→
Abidjan	→	→	→	→
Bouaké	→	→	→	→
Accra	→	→	→	→
Kumasi	↑	→	→	→
Lagos	↓	↓	→	→
Kinshasa	→	→	→	→
Addis Ab.	↑	↑	→	→
Nairobi	→	→	→	→
Dar es Sal.	→	→	→	→
Maputo	→	↑	→	↑
Kampala	→	→	→	→
Gauteng	→	→	→	→
Cape Town	↑	↑	→	→

Legend : **For each key issue, current assessment and identified trend**

- under control, low concern
- significant concern
- strong concern
- ↑ getting better
- → unchanging
- ↓ getting worse

Concerning **organization**, in almost every case, the process of devolution or decentralization of powers remains unfinished, resulting in unclear inter-governmental roles and responsibilities and a lack of cooperation between the different tiers of government.

Very few African cities have a well-developed single authority to deal with urban mobility and transport. Where such authorities do exist at a metropolitan-wide level, they have generally not yet attained the maturity, fiscal powers and legitimacy to assume effective control over all modes of transport in the urban environment. The few multimodal transport authorities that do exist, in Casablanca, Abidjan, Lagos and Dakar, for example, have only started to make a significant impact on the complex and institutionally fragmented environment in which they function.

Further, as a result of weak governance, while sustainable urban mobility policies tend to strongly promote public transport, the reality is that most cities have developed around individual transport and public authorities in African cities often struggle to control the supply side of public transport and traffic management. This appears clearly where congestion seems out of control and where scheduled bus services are entirely missing, such as in Bouaké, Nairobi or Accra, most often superseded by paratransit services, as in the majority of the twenty representative cities.

This paper found that Cape Town is one of the most advanced African cities in this respect, having introduced regulatory systems that improve control over paratransit services. Like Lagos, both Cape Town and Johannesburg have involved elements of the paratransit sector in the ownership and operation of new BRT systems. Another success is the mechanism put in place to renew the minibus fleet in Dakar, which indirectly made it possible to improve the regulation of the public transport system.

In brief, institutional organization in the transport sector remains a clear challenge for most urban areas of Africa.

However, if well-conceived institutions and coordination processes are necessary, they are not enough to ensure adequate provision of a sustainable urban transport system.

Adequate **human resource** is a critical condition for institutions to function. Today most national and local public administrations in charge of urban transport in Africa suffer from a clear lack of staff with adequate and specific competences in the various fields of urban transport (economics, public transport engineering, traffic management, sociology, etc.).

Technical schools or universities involved in research and teaching activities in the fields of urban transport are extremely rare on the African continent. This should constitute a priority concern for national decision-makers, since it is not reasonable

to expect significant improvements in this sector without specific knowledge and technical know-how.

Looking at **financial resources**, African policy- and decision-makers having only recently begun to give priority to the challenges of urban mobility and their implications for economic, social and environmental well-being, financial resources currently available to develop and sustain urban transport systems in Africa are insufficient and need to be increased in upcoming years.

Where large amounts are or have been allocated to urban transport, priority is often given to large investments in the provision of new road infrastructure. Investments in public transport and NMT-dedicated infrastructure remain low, even if significant examples can be highlighted. One should note that except in Tunis and Cairo, all significant public transport infrastructure projects in Africa have been implemented in the last decade, with support in some cases by international financing institutions (for example the BRTs in Lagos, Johannesburg and Cape Town, Gautrain in Johannesburg, and the LRTs in Rabat and Casablanca). Such investments usually benefit from state subsidies at operating level (to cover debt servicing and a portion of operating expenses). It is relevant to note that some further mass public transport projects are ongoing (such as regional trains and BRT), attracting large investments almost always concentrated in the largest conurbations.

Although large public transport projects require significant financial resources, they remain dependent on the functioning of the entire transport system, including traffic conditions and adequate connections with feeder public transport services. Moreover, the financial sustainability of scheduled public transport is seldom guaranteed. In cities such as Tunis, Abidjan, Ouagadougou, Dakar or Casablanca, in the absence of clear subsidy agreements, the State has occasionally been required to intervene in order to refloat bus operators.

Sustainable financing mechanisms, whether for investment, operations or maintenance have yet to be established. Local taxation is a major challenge and its potential has not yet been properly developed.

As already noted, urban transport systems struggle to respond to increasing travel demand in the context of rapid urban growth. Overall, integration of **land use** and transport planning often fails at all spatial levels, from city-wide strategic planning to street design.

Most urban areas do not benefit from a clear long-term vision for their spatial development at the metropolitan level, particularly not one that incorporates urban mobility needs beyond road infrastructure. The focus on infrastructure projects (e.g. construction of roads and highways, bus stations or similar investments) often overrides any overarching integrated urban thinking and planning. Future urban travel needs are at best considered through land-use reservations in urban master plans, but seldom as a structural component of 'city making'. In Abidjan, for example, employment opportunities and residential areas are situated far from each other. There is little functional diversity in the urban fabric (across the metropolitan area as well as within neighborhoods), so residents are dependent on long commutes to their places of work and to access other economic and social opportunities and amenities. This situation is particularly challenging for the poor and the pedestrians which represent the larger share of movements in urban areas in Africa.

Even when well-planned public transport projects are implemented, they are seldom regarded as opportunities to modify the urban fabric; little attention is given to the range of activities that a high-level transport supply attracts and facilitates. Increasing densities along corridors, and capturing part of the gains in land value, are opportunities that are often overlooked. Making it even more difficult to integrate transport planning and land use, land use management by itself also remains a major challenge in most urban areas of Africa.

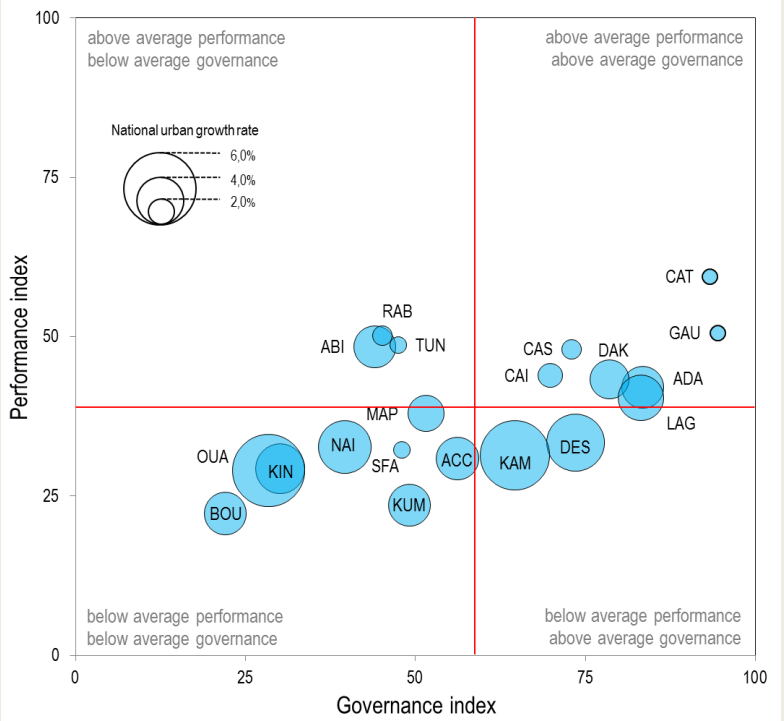
Box 2: Tentative city typology based on urban transport performance and governance indices

Lack of reliable and comparable data is a real problem for anyone working on, or in charge of, urban transport in Africa. Confronted with this problem, as were previous studies to assess and compare urban transport systems in Africa **(e.g. Kumar and Barrett 2008, UN-Habitat 2010, UITP-UATP 2010)**, an attempt has been made for this policy paper to address it by incorporating qualitative information (derived from information provided by resident experts in the selected case cities) in the comparative quantitative information derived from a systematic compilation of available secondary data (the methodology to calculate indices is presented in appendix 2 and the data collected during the preparation of this paper are provided in a separate document).

On this basis, a "city typology" was established to support benchmark analysis in the twenty case cities, while enabling further and deeper analysis in future years as more and better data become available.

Illustrated below, this typology is centered on the development of two indices which measure the performance and governance of urban transport systems (**a description of how the two indices were calculated is provided in annex 2).**

Figure 4. Urban transport Performance-Governance chart, with indication of forecasted national urban growth rates 2010 -15



Source for urban growth rates: CIA World Factbook

Two types of urban areas can be identified in the below average governance & performance quadrant:

- Nairobi, Kinshasa, Accra and Maputo have large populations, and rapid urban growth and sprawl, but no scheduled public transport and no public authority[1] dedicated to managing the transport system. Congestion is chronic, and decision-makers face strong difficulties to make, or do not consider, urban mobility inefficiencies a priority relative to other urban development issues.
- Bouaké and Kumasi are intermediate-sized cities, in which the transport system is underdeveloped, and coordination and leadership capacity appear rather weak. Poor accessibility and mobility is an issue, but without the same sense of urgency as for the other cities in this quadrant.

The above average governance & performance quadrant can be divided into three broad groups of urban areas:

[1] Since data were collected for this paper, the decision was taken to create the Nairobi Metropolitan Transport Authority.

- The two South African metropolitan areas, while not necessarily ideal with respect to devolved functions and qualified mandates, have established and resourced public authorities that have recognized urban mobility issues as a priority, and response measures are being implemented. These urban areas are forerunners on the continent with respect to project implementation (e.g. BRT, paratransit formalization and electronic road tolling).

- In a second group, urban areas such as Casablanca and Dakar are found in which urban transport authorities have been established, planning studies have been carried out, and first mass transit lines have been implemented or are at an advanced stage of planning. The ability of these cities to successfully manage the major challenges and pressures they face, and sustain the implementation of improvements, is uncertain.

- While Lagos and Cairo could be included in this previous group, they need to be considered as special cases because of their large populations. The nature of the challenges they face, and their ability to manage urban development, is uniquely related to their size.

In the below average governance & above average performance quadrant, Tunis and Abidjan both benefit from past efforts to improve transport systems, but are confronted with strategic governance difficulties. The third city in this quadrant, Rabat-Salé, has recently implemented its first light rail line, and is in the process of strengthening its institutional framework, at both political and technical levels.

In the above average governance & below average performance quadrant, both Kampala and Dar es Salaam have improved their governance framework, and initiated BRT-projects, but the benefits of these initiatives are not yet fully realized. Paratransit vehicles and motorcycle taxis are still dominant and service quality remains poor.

Finally, the figure above shows that the strongest urban growth rates are expected in urban areas of the lower quadrants, with already below average performance indices. It is interesting to note that the main cities located in North and Southern Africa showing above-average performance indices have lower urban growth rates compared to most Sub-Saharan cities.

Key issues related to urban transport systems

The table below presents an overview of the qualitative assessment of urban transport systems carried out in the twenty selected urban areas.

Table 3: Assessment of key urban transport supply system issues for the twenty selected urban areas of Africa

System dimension	TRANSPORT SYSTEM		
Key issues	Public space	Transport services	Transport infrastructure
Cairo	→	↑	↑
Tunis	↓	↓	↓
Sfax	→	↓	↑
Rabat-Salé	→	↑	→
Casablanca	→	↑	→
Dakar	↑	→	→
Ouaga.	→	↓	→
Abidjan	↓	↓	↓
Bouaké	→	↓	→
Accra	→	↓	↓
Kumasi	→	→	↑
Lagos	→	↓	↑
Kinshasa	→	↓	↓
Addis Ab.	↑	↑	↑
Nairobi	→	↓	→
Dar es Sal.	→	→	↓
Maputo	↑	↑	↑
Kampala	→	→	↓
Gauteng	↑	↑	↑
Cape Town	↑	↑	↑

Legend: **For each key issue, current assessment and identified trend**

- under control, low concern
- significant concern
- strong concern
- ↑ getting better
- → unchanging
- ↓ getting worse

As illustrated in the table above, the analysis of the twenty urban areas reveals varying degrees of similar and contrasting issues:

- In Casablanca (Morocco), the development of mass public transportation lags far behind that of other cities of similar size (five million). Because of urban sprawl, the outlying suburbs are not served by the public transport supply system; these areas are seeing the proliferation of 'grands taxis', vehicles with five seats that can accommodate as many as six passengers and a driver. Chronic congestion of the main traffic arteries hampers the functioning of the city economy and the performance of regular public transport in particular.
- In Nairobi, paratransit vehicles (known as 'matatus') dominate the public transport supply system. Like the 'gbakas' in Abidjan, they are formally recognized by the Government through transport licenses but, to a large extent, they operate at a 'survivalist' level as small or micro businesses. The matatu sector is characterized by its informal nature, which makes it difficult to control and regulate, arbitrary pricing at times, and its low compliance with the rules of the road. Some routes are over-traded, and the great number of vehicles contributes to road congestion. In Nairobi as well as in Dar es Salaam, Kampala and Kinshasa, paratransit is not always available (particularly beyond the central areas) and is supplemented by an informal supply of scooters and motorcycle taxis – all of which accentuate the general disorganization of urban road space (with chaotic traffic, haphazard parking on public space, etc.).
- In comparison, findings emanating from field reviews in cities like Cape Town, Johannesburg, Accra and Dar es Salaam, indicate that, if properly regulated, the paratransit sector can play a significant role in providing safe and reliable transport services in the context of lacking large scale scheduled bus or rail services.
- Cities such as Cape Town or the city region of Gauteng see a modal share of over 50% for private car use (up to 65% in Gauteng). Nevertheless, public transport supply is also dominated by paratransit (usually minibuses). These cities are also known for their rapid urban development and long travel distances. In the case of Gauteng, the supply of public transport appears to be at the heart of government concerns at all levels, as can be deduced from the various large scale initiatives undertaken in recent years and plans and initiatives underway.
- Unlike the cities above, Tunis' has a relatively good public transport infrastructure, but it reaches saturation during peak periods, both on the rail

network, the light rail lines and the bus lines (which do not benefit from any form of road space prioritization).

- In Bouaké (Côte d'Ivoire), it is primarily the lack of paved roads that impedes any attempt to deliver services and limits accessibility by public transport vehicles. The deterioration of the road network has led to the popularity of the motorcycle taxi.

In most, if not all, urban areas of Africa, non-motorized transport (NMT), particularly walking, is the dominant mode; walking makes up between 50% and 90% of daily trips. Yet, NMT receives very little attention; most African cities lack adequate sidewalks, or signalized and safe intersections, and accessibility to public transport stations is inadequate. Road intersections and pedestrian pathways (where they exist) are often usurped by motorists using the space as parking, or by street vendors using the space for trading. In addition, it is often reported that cycling is regarded as socially unacceptable.

In brief, there is a very strong potential for improvement concerning the layout and maintenance of **public space** in urban areas of Africa, with the aim of promoting safer and more dignified travel conditions for pedestrians.

While the extent of congestion, infrastructure provision and scheduled public transport service provision may differ widely from city to city, the following observation is common to all: there is neither enough public transport, nor is it of sufficient quality. Accessibility and mobility are thus inadequate in terms of quantity (i.e. spatial and temporal coverage), equity (availability to all), and quality (i.e. safe and clean road space, and safe and fit-for-purpose vehicles). In the vast majority of urban areas of Africa, public **transport services** are provided by paratransit operators, who usually concentrate on the most profitable routes.

Common to most African cities are the absence of effective fare regulation and the difficulty of recovering costs, which are problems for both travelers and operators. Most public operators perform poorly, as a result from weak organization, high maintenance cost, low fares without compensation for public service obligations, poor commercial speeds (associated with poor traffic management practices in many of the cities observed), and strong competition from paratransit operators.

Table 4 below provides an overview of available public transport modes in the twenty benchmark urban areas considered in the study. Scheduled (mass) public transport is available in large urban areas of North and South Africa, but remains

an exception in urban areas of Sub-Saharan Africa, where paratransit dominates everywhere.

Table 4. Overview of available public transport modes in the benchmark cities, 2013

	Rail	BRT or LRT	Buses	Minibuses	Shared taxis	Moto-taxis
Cairo	■		■	■	■	
Tunis	■	■	■	■	■	
Sfax			■	■	■	
Rabat-Salé	■	■	■		■	
Casablanca	■	■	■		■	
Dakar	■		■	■	■	
Ouagadougou			■		■	
Abidjan			■	■	■	
Bouaké				■	■	■
Accra			■	■	■	■
Kumasi				■	■	■
Lagos		■		■	■	■
Kinshasa	■		■	■	■	■
Addis Ababa			■	■		
Nairobi	■		■	■		■
Dar es Salaam				■		■
Maputo			■	■		
Kampala				■	■	■
Gauteng	■	■	■	■		
Cape Town	■	■	■	■		

Box 3: Paratransit, an important sector that needs to be integrated in urban transport policies

Largely as a result of the pressures arising from rapid urban growth, the informal sector plays an important role in most national economies, and brings with it significant challenges regarding the monitoring, regulation and control of all aspects of the urban economy. Rapid urbanization has in many instances taken the form of uncontrolled urban sprawl, with informal settlements on the outskirts of the cities where land is available and services are often non-existent. In many urban areas of Africa, land-use management systems have collapsed and private developers and poor communities are taking advantage of the inability of city governments to implement well-intended spatial plans.

As the poorest communities usually settle furthest away from economic opportunities and social amenities, most African cities have seen significant growth in the informal / artisanal or paratransit sector. The term paratransit is used here to refer to a flexible mode of public passenger transportation that does not operate according to fixed schedules, typically in the form of small- to medium-sized buses.

The growth of paratransit probably results from complex transport and labor market antecedents. On the transport side, it is certainly correlated to the inability of central and local authorities to adequately plan for, and respond in good time to the growing demand for mobility (Kumar and Barrett 2008). In the absence of well organized, regular and efficient public transport, paratransit services have flourished, and today most African cities have a large combination of buses of different sizes, sedan taxis and motorcycle taxis that operate under varying degrees of regulation and law enforcement. However the growth of paratransit in African cities is also the symptom of the high prevalence of informality generally in African urban labor markets; African cities are not creating adequate formal job opportunities through more traditional means experienced in other world regions, for example, through the growth of tradable services or the manufacturing sector, so informal, non-tradable services, including paratransit services, are an important means of livelihood for many urban households.

As a result, the paratransit sector is in most contemporary African cities an important but complex socio-political and economic force. It therefore has to be viewed as a key stakeholder in any attempt at improving the overall state of the urban transport system.

Concerning **transport infrastructure**, and focusing on road infrastructure, the vast majority of urban areas of Africa suffer from major traffic congestion, despite generally low motorization rates. This is usually the result of weak traffic and parking management, inadequate road layout and maintenance, poor driving behavior and insufficient enforcement.

In Kinshasa, for example, congestion is not so much due to the high level of traffic but rather the combination of suboptimal layout and management of the main intersections on the road network; inadequate road maintenance (pavement deterioration causing traffic disruptions, narrowing lanes, etc.); disorganization of road space and lack of control and enforcement by the police; sudden stopping by minibuses, illegal double parking; and occupation of the roadway by pedestrians lacking dedicated space. This loss of capacity in the road network is a recurring theme. In Addis Ababa, the ring road that serves the city is used at only 25% of its capacity, while the city center suffers from heavy congestion during peak hours.

As a matter of fact, like in any other region of the world, the road network in urban areas in Africa is essential as it supports urban multimodal traffic, and therefore also, public transport and NMT. However, most urban road networks in Africa are neither built nor operated in a satisfactory manner.

There are, however, exceptions. For example, in the South Africa's Gauteng city region, which is one of Africa's most congested urban conurbations, the national and provincial government decided to invest heavily in the region's road network, and to fund this investment by means of a state-of-the-art e-tolling system. At the same

time, the provincial government invested in a high-speed rail link between the three main municipal jurisdictions in the region, which are in turn designing bus rapid transit systems aimed at reducing travel time, countering the spatial legacy of apartheid, and enhancing urban efficiency.

From the analysis above, there is more to road infrastructure management than development and maintenance. Traffic management, smart traffic signaling, intelligent transport systems and enforcement are all necessary to improve the performance of these public assets. In Nairobi, Casablanca, Dakar, Accra, Addis Ababa and Lagos, the concept of traffic management through centralized traffic control systems is at an early stage of development. In other cities, it is either embryonic or does not exist. Overall, the potential for optimizing road infra-structure by optimized exploitation of time and space is largely untapped.

Key issues related to the impacts of urban transport

The table below presents an overview of the global assessment carried out in the twenty selected urban areas concerning the negative impacts and externalities of urban transport. It should be noted that most insights in this section rely entirely on qualitative assessments, since specific data remains rare or difficult to obtain, especially at an appropriate urban level.

Table 5. Assessment of key urban transport impact issues for the twenty selected uban areas of Africa

System dimension	IMPACTS		
Key issues	Road safety	Environmental quality & resources	Travel cost and time
Cairo	→	→	→
Tunis	↓	↓	↓
Sfax	→	→	→
Rabat-Salé	→	→	→
Casablanca	→	→	→
Dakar	↓	↓	↓
Ouaga.	→	→	→
Abidjan	↓	↓	↓
Bouaké	→	→	→
Accra	↓	↓	↓
Kumasi	→	→	→
Lagos	→	→	→
Kinshasa	↓	↓	↓
Addis Ab.	↑	↓	↓
Nairobi	→	→	→
Dar es Sal.	→	→	→
Maputo	→	↓	↑
Kampala	→	→	→
Gauteng	↑	↓	↓
Cape Town	↑	↓	↓

Legend: **For each key issue, current assessment and identified trend**

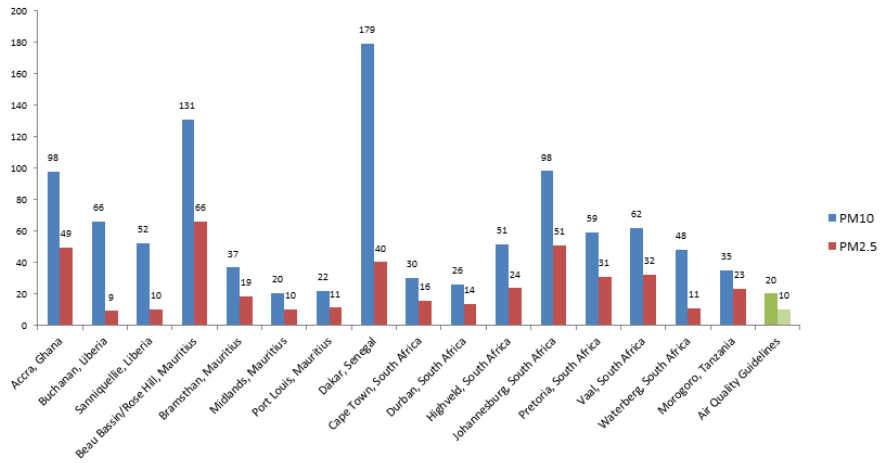
	under control, low concern	↑	getting better
	significant concern	→	unchanging
	strong concern	↓	getting worse

One of the most visible and sensitive negative impacts of transport in African cities is poor **road safety**. Although reliable figures are not specifically available for most of the twenty cities, there is no doubt that road danger is acute, and that pedestrians and people with reduced mobility are most at risk. According to the World Health Organization's 2013 report, while Africa possesses only 2% of the world's vehicles, it represents 16% of the global road fatalities, with a regional average of 24.1 deaths per 100'000 population (against a ratio of 10.3 in Europe). The majority of persons killed on the roads are young adults, with 62% of all deaths aged between 15 and 44 years. Vulnerable road users – pedestrians, cyclists and motorized 2- and 3-wheelers – constitute more than half (52%) of road users killed, with pedestrians alone being 37%.

Some of the main contributing factors to poor road safety are road space design and operation; the way in which non-motorized modes are ignored; partial compliance with basic rules of the road; high volumes of motorized two-wheelers (vulnerable to crashes); disorganization of road space aggravated by sudden stopping by paratransit services; and inadequate monitoring of vehicle roadworthiness, including public transport vehicles.

The increasing traffic volumes and chronic congestion observed during peak periods in these cities contribute to **air and noise pollution**, exacerbated by the age of the fleet, including minibuses and high particulate-emitting buses. In cities where the numbers of motorized two-wheelers have risen sharply, pollution is even greater.

Figure 5. Annual mean of PM10 and PM2.5 (µg/m3) in African cities



Source: Urban Air Quality in Cotonou, SSATP Note 33
http://www.ssatp.org/sites/ssatp/files/publications/SSATP-TechnicalNotes/ATTN33.pdf

All African cities which monitor air pollution have levels of small particulate matters significantly above the level recommended by the WHO. Good air quality goes indeed hand in hand with economic development. The SSATP Technical Note33 estimated already in June 2001 the cost of air pollution in Cotonou, Dakar and Ouagadougou at 1.2%, 2.7% and 1.6% of the national GDP.

Although many African countries are among the smallest contributors to climate change globally, they are often vulnerable and likely to be significantly impacted upon by the consequences of climate change such as extreme weather conditions, which could in addition result in major economic and social problems such as forced migra-

tion and food shortages. Enhanced climate resilience should therefore be a strong concern for policy- and decision-makers, in particular when it comes to developing urban transport infrastructure.

Although non-CO2 emissions may be for the time being the predominant issue in the cities included in the present paper, climate mitigation measures should also be on the agenda and initiatives such as the renewal of obsolete minibuses in Dakar or the taxi recapitalization program in Johannesburg and Cape Town, as well as exploratory discussions on the use of bio-fuel in South Africa, should be encouraged.

Finally, mobility is both time-consuming and expensive for most urban dwellers in Africa. In Johannesburg, Accra, Lagos, Nairobi and Abidjan, it can take anything from two to four hours in any one direction to access workplaces and other economic opportunities and social amenities. This affects the competitiveness and attractiveness of these cities, and can be detrimental to their overall economic growth and development. From a social perspective, affordability and inclusiveness of available urban transport options are major concerns, given the importance of the transport budget in the household incomes of the poorest populations, both in Sub-Saharan and North Africa. This issue also reflects a complex interaction between the demand and the supply side of both transport and housing, within the constraint of household income.

These impacts and externalities weigh negatively and in some cases dramatically on individual living conditions as well as on entire communities, putting a significant strain on the economic competitiveness of African cities and countries. So there is an urgent need to take serious action in favor of sustainable accessibility and mobility in urban areas of Africa.

3. Lessons from international experience in improving mobility and accessibility

In recent history, accessibility and mobility in African urban areas have been continuously influenced by changing urban forms and land use and by the emergence of informality in most transport systems. Indeed, the recent urban history of the continent is one where rapid and unplanned growth of urban territories – primarily by means of informal and/or illegal settlements sprawling in the outskirts of urban areas – is coupled with the decline of formal transport systems and the consequent appearance of informal transport options. Such increasing pressure has continuously added strain to road infrastructure and to previously established transport systems. While significant efforts have been made in some cities, with varying results, governments, lacking financial and technical capacity have generally been unable to stop the deterioration and, sometimes, the collapse of infrastructure and formal transport systems. This crisis has exacerbated prevailing challenges in mobility and made the implementation of change even more difficult.

The current state of accessibility and mobility in Africa is specific to each urban area. As shown in the previous chapter, varied levels of governance and different performance indices – measuring the quality of the transport systems and some of their main impacts – are found throughout the continent. The analysis of 20 case cities revealed both significant variability and certain common trends concerning urban mobility and transport systems. The review of the case cities helped to identify key mobility issues that point to the general weaknesses, albeit with few notable exceptions, of urban transport systems in Africa. From the study of the case cities in the previous chapter, it appears that key issues relate to three system levels: (1) the governance framework; (2) the transport system; and (3) the negative impacts and externalities related to the transport system.

This chapter identifies important lessons from international experience that relate to each of these key subjects and presents city specific examples that illustrate the value of these lessons. The examples contain both positive and negative lessons that are

relevant and should be considered when conceiving and implementing solutions to improve accessibility and mobility conditions in African urban areas.

Improving the governance framework

Clear institutional framework and strong political vision: the chicken and egg story

This paper and a number of other studies have identified several significant limitations to the ability to efficiently govern urban transport systems in Africa. Among them, the lack of continuity of actions and, similarly, the lack of long-term strategies are of importance. In worst-case scenarios, cities lack any type of plan to address mobility issues, while in the majority of cases, when such plans exist, they are rarely carried through by implementing authorities. Too often, new plans are enacted, but only to be rapidly substituted when a change in the administration happens. Newly voted or designated authorities tend to disregard efforts made by their predecessors and often abruptly halt or modify any program being implemented.

Furthermore, even if a relative continuity of programs and vision is achieved, the lack of coordination and monitoring among the various entities involved in urban transport hampers the effectiveness of such programs. Indeed, responsibilities are often scattered among a myriad of national, regional (or provincial), metropolitan and local entities, often without sufficient clarity, resulting in responsibilities being either neglected or confusingly held by two or more entities. These characteristics partly explain a relative ease for private stakeholders to overstep boundaries and to sometimes benefit from largely unregulated contexts.

In Africa and elsewhere, the creation of a transport planning and regulatory metropolitan agency has generally been recommended in order to solve the problematic distribution of responsibilities. This new institution is expected to take over as the lead agency for transport planning in the city and/or metropolitan area, for the regulation of the public transport supply and for quality improvements to the transport system overall, including sometimes traffic and parking management. Fleet renewal programs (such as the Dakar Cars Rapides renewal scheme) and BRT construction projects (such as the Lagos BRT-Lite) would most likely not have been successful without the creation of such institutions. However, even if their role is rather well defined on paper, their implementation has generally proven difficult and their initial scope has often been significantly reduced over time. Strong political dedication and

adequate resources are needed. An example of a remarkably successful urban transport agency is that of the Singapore Land Transport Authority (Box 4).

Box 4: Singapore Land Transport Authority

The Land Transport Authority (LTA) is the lead organization for land transport development and policy setting in Singapore. In such a small and completely urbanized territory, land transport means urban transport. LTA plans the long-term transport needs of the city, overseeing all road uses, including private and public transportation. The authority's fonctions include the following:

- Formulation of land transport policies; integration of transport planning with land use (working closely with town and land use planners from the Urban Redevelopment Authority, Housing Development Board, and Jurong Town Corporation to ensure that roads and other transport systems, such as new rail lines and bus routes, are well planned and properly integrated with urban, residential, industrial, and commercial developments).
- Planning, design, and development of rapid transit systems (RTS) and road infrastructure systems (focusing on system integration and technical design details).
- Management of road traffic and maintenance of related road infrastructure and systems.
- Promotion and regulation of public transport (imposing, monitoring, and measuring minimum operating performance standards for bus and rail services in terms of service quality, safety assurance, and equipment performance).
- Regulation of private transport ownership and usage.
- Centralized bus network planning.

LTA also assists the Public Transport Council (PTC), established in 1987, in the regulation of bus and rail fares and bus services. The PTC is empowered to license bus operators and enforce penalties as provided in the Public Transport Council Act while LTA acts as central bus planner assisting the PTC in actively monitoring and tracking the provision of bus services and compliance with bus service standards. LTA also regulates the taxi industry. Finally, since 2010 and its acquisition of TransitLink, LTA has been able to offer an integrated fare collection system for the bus network and the rapid transit systems.

Source: Kumar, A. & Agarwal, O. P., 2014, Institutional Labyrinth, The World Bank

Developing capacity in the urban transport sector: it can be done with time and effort

In relation to transport programs and, more particularly, to public transport projects, African cities are currently constrained by their limited ability to plan and manage urban transport systems. Substantial problems arise in particular when the technical capacity within planning entities (be it at national, regional or local level) is inadequate. As shown by the experience of many countries, building this capacity within public institutions takes substantial efforts over a long period of time. Belgium pro-

vides a valuable example of how institutional capacity can be built and sustained on a large scale (Box 5).

Box 5. "Conseillers en mobilité" – Belgium's initiative to build institutional capacity in urban mobility planning and management

At the end of the 1990s, following a significant rise in motorization, most Belgian cities were facing increasing congestion, deterioration in the supply of public transport, and a degradation of the urban environment. Regional and municipal authorities found it difficult to deal with these problems due to a lack of the necessary skills at all levels of the administration.

The Walloon Region, one of the three entities comprising the Kingdom of Belgium, was the first to set up, as early as 1998, a training program for 'Conseillers en Mobilité' (Mobility Advisors) aimed at public administrations. The basic training covers the main technical areas related to mobility planning and management. Within the public administration, the role of the advisor is to act as a relay between the different stakeholders (politicians, technical departments, interest groups, users, operators, etc.). The program forms part of the "Charter for Mobility", which commits all stakeholders to develop a municipal or inter- municipal mobility master plan for public and non-motorized transport targeting quality of life and environmental improvements. Prerequisites to obtain funding from the Region for municipal mobility projects (e.g. investments on road or public transport networks) include not only the adoption of a mobility plan, but also training and putting in place at least one advisor within the local administration.

Since 1998, more than 1,000 mobility advisors have been trained and placed in Wallonia, in addition to which there are 300 advisors in the Brussels-Capital region. This network constitutes a community of practice and exchange, and is supported by regular publications, advanced training, workshops, an annual symposium and regular technical visits.

Source: (1) La CeMathéque n° 28, Dossier thématique, Conseiller en mobilité : une formation, une fonction, un métier. (2) http://cem.mobilite.wallonie.be. (3) http://www.bruxellesmobilite.irisnet.be.

Substantial and sustainable financial resources : the sinews of urban transport systems

Excluding very few notable examples, most African cities struggle to find substantial and sustainable resources. Transport, like many others sectors, suffers from a critical lack of financial resources due to their weak fiscal capacity. To address this issue, national and local authorities need to look for innovative fiscal mechanisms beyond fare box revenue and subsidies from the government. However, it is often a prerequisite that an effective decentralization policy exists, which gives a certain level of fiscal autonomy to local authorities.

Earmarked taxes exist in many cities of the world to finance urban transport expenditures and various tax bases are used: gasoline consumption, car ownership, wages, land value, car parking, etc. In Argentina, Buenos Aires' metro extensions' funding

program provides interesting insights on how vehicle and land ownership taxes can help finance infrastructure projects (Box 6). The case of Nottingham in UK is another example of fiscal innovation where funds are levied to allow local authorities to implement a mass transit system (Box 7).

Land value gains capture can also be a major source of funding for urban transport infrastructure, particularly public transport projects. There are many examples of successful schemes in the world. The cases of Japan and Hong Kong are well known. Box 8 presents the case of the Dublin tramway.

Box 6: Funding extensions to the metro network in Buenos Aires (Argentina)

In 1987, the city of Buenos Aires enacted a law that set up a mechanism to raise funds for the metro lines' extension projects. Initially, the law created a fund that was fed by a 10% tax on vehicle ownership and a 5% tax on land ownership. In 2002, another source of revenue was added: a 2% additional tax on land owners that were within 400 meters of the proposed extension of a metro line (Pinilla Pineda 2013).

Justifying the creation of the fund was the idea that metro extensions benefit the entire city and its inhabitants. Conceived by authorities as an equitable mechanism, it assumed that there was a direct and positive link between the construction of metro infrastructure and increasing land values.

The fund proved to be relatively sustainable and successful as it managed to pay for 54% of expenditures related to metro extensions between 2002 and 2004. Metropolitan authorities, utilizing income from other general sources, financed the remaining 46% (Gobierno de la Ciudad de Buenos Aires 2006).

Source: (1) Pinilla Pineda J.F., 2013: La captura de valor como fuente de financiacion de la infraestructura de transporte publico y sostenible en America Latina. CAF Latin America. (2) Gobierno de la Ciudad de Buenos Aires, 2006: Programa urbe y tributacion – Instrumentos economicos para la gestion del suelo. Gobierno de la Ciudad de Buenos Aires. Buenos Aires, Argentina.

Box 7: Workplace levy in Nottingham (United Kingdom) to develop tram network

The concept of road user charging scheme was introduced in Great Britain by the Transport Act 2000. This reform opened the possibility for local governments to set up a congestion charge, like London did in 2003, and the "workplace levy" which is a tax on company parking spaces. This mechanism was selected at the end of 2011 by the city of Nottingham in order to reduce traffic congestion and partly fund the extension of the tramway as well as renovation of the stations.

The tax is paid by employers with more than 10 parking spaces. About 500 employers are affected. Those who are exempt include essential services such as hospitals as well as disabled parking and customer/visitor spaces. The initial annual cost of the license, which has been in place since April 2013, was about €400 per space. Based on the expected annual increases (annually 7% in 2014 and 2015), this tax should bring €16.5 million on average per year in 2015.

Source: http://www.nottinghamcity.gov.uk/wpl

Box 8: Land value capture: the experience of the Dublin tramway (Ireland)

The Dublin tramway, opened in 2004, was partially financed by a Development Contribution Scheme. In Ireland, the law requires property developers to pay a standard financial contribution to help fund utilities in the area in which their project is being developed. They must also pay an additional contribution on top of the standard financial contribution based on the increase in land value in the vicinity of the new infrastructure.

Two articles in the Irish Planning and Development Act of 2000 allowed urban planning authorities to issue authorizations to develop land near public transport stations on condition that the private developers contribute financially to the work necessary to complete the new transport infrastructure. The tax is directly proportional to the land value increment generated by the public transport project.

In the Dublin tramway example, contributions totaled €250,000 per hectare in residential areas and €570,000 per hectare in commercial areas. This scheme helped finance part of the capital invested and opened new areas for urbanization, thus offering new opportunities to developers willing to pay the supplementary contribution. Moreover, urban development around stations has generated a new clientele and increased income from fares. This is therefore a win-win situation for both the transport authority and the property developers.

Source: Agence Française de Développement (AFD), CODATU and CEREMA, 2014, Who pays what in urban transport

Land use and transport development are inextricably linked

In Africa, it is typical that road infrastructure plays a determining role in the location of economic activities and human settlements. Indeed, it dramatically increases the attractiveness of adjacent land. Yet, it is often not commensurate with the mobility needs that it generates, and uncontrolled development stifles the efficient use of the very infrastructure that generated it.

Integrating land use and transport requires political awareness, long-term vision, suitable planning tools, strong coordination and control, all of which have not yet firmly established themselves in most urban areas of Africa as well as in many emerging countries. The superposition of traditional land ownership and allocation systems with modern rule-based, but weakly administered, land use control systems has also made land management hugely complex for all involved. More often than not, decision making and technical capacity is limited, and transport and land use departments are overly compartmentalized. Limited financial resources and poor or inadequate data contribute to the difficulties met in integrating land use and transport policies and projects in African cities.

Curitiba (Brazil) serves as an example of the opposite: there, an integrated approach to land use and transport planning and development has been in place for many years; it is visible at both the institutional and the physical (on-the-ground) levels.

Box 9: Curitiba (Brazil), a unique case of land use and public transport integration in the developing world

Curitiba's history of land use and transport planning integration started with the creation of IPPUC – the city's autonomous planning authority – in 1965. Focused on urban development research and planning (Ardila Gomez 2004), it has become a highly capable entity with sufficient financial and technical resources and has designed key elements of the land use-transport system.

Unusual in the developing world, the 1966 'Plano Diretor', or master plan, led the city's physical growth process during the 1960's and 1970's (Macedo 2004). Indeed, the plan's main public transport routes with, first, exclusive bus lanes (later upgraded to a full-specification BRT system), guided physical urban growth instead of needing to be retrofitted in an already built environment, as is more commonly the case in the developing world.

The physical structure of the city is based on three pillars: (1) public transport services; (2) the roadway system; and (3) land use. In effect, the main public transport axes are accompanied by adequate road infrastructure, along which high-density urban growth is concentrated. Public transport corridors thus determine high-density corridors in the city. Densities gradually decrease as distance from main corridors increases.

Source: (1) Ardila Gomez A., 2004: Transport planning in Curitiba and Bogota – Roles in interaction, risk and change. PhD dissertation. Massachusetts Institute of Technology. Boston, United States. (2) Macedo J., 2004: City profile – Curitiba. Cities vol.21 no.6.

At a more operational level, the case of Hong Kong (Box 10) shows how a public transport company can integrate the expansion of its system with major new developments in housing and commercial activities.

Box 10: MTRC in Hong Kong - an ongoing success story in integration of urban development and transport

The Mass Transit Railway Corporation (MTRC) was founded in 1975 by the government of Hong Kong to build a high-performance public transport system. The government, which still holds a large majority stake in MTRC's capital, does not grant any subsidies to the company to manage its network. However, the land acquisition procedure is very favorable because the government grants MTRC land, instead of auctioning it off. MTRC has thus been able to be a lead force in urban development at the same time as it has expanded the public transport system.

Between 1979 and 1998, the opening of five metro lines was accompanied by a number of real-estate transactions, often carried out in partnership with other property developers, in the vicinity of the depots and stations of the public transport system. This strategy, called "Rail+Property", has enabled MTRC to generate large profits by selling or renting out residential and commercial properties. Today, the company's revenues derive predominantly from the management of more than 90,000 housing units and 2 million square metres of commercial space (in 13 shopping malls and 5 office buildings) built around 33 tramway stations.

All the players involved in the process have benefited from urban development and transport planning being integrated: the public authorities, the developers, the passengers of MTRC, the tenants of the developments around MTRC stations and their customers.

Source: Agence Française de Développement (AFD), CODATU and CEREMA, 2014, Who pays what in urban transport

Making the transport systems more efficient

Attractive cities are walkable cities

Globally, the development of safe pedestrian areas is seen as an essential step towards the development of livable streets and neighborhoods. In a few advanced developing world cities, where transport policies acknowledge the dominance of walking and cycling, these policies include specific actions aimed at "giving back" space to the non-motorized transport users. The demolition of an elevated highway over the Cheonggyecheon River in Seoul (South Korea) to create a public park along this river is now a symbol of urban renewal. Bogota (Colombia) is another example of giving back urban space to the public in general and to non- motorized users specifically (Box 11).

Box 11: Bogota's (Colombia) less publicized but highly effective public space projects

Undoubtedly, Bogota is known in transport circles for its Transmilenio BRT system. At the same time, the city also started an aggressive campaign to reclaim public space from private users and to build a network of bicycle lanes in the city. These initiatives were based on previous efforts that resulted in strengthened institutions, sustainable financial practices, and a stronger civic culture (Salazar, 2008).

During the 1980's, Bogota's public spaces, sidewalks and road space experienced rapid deterioration. Sidewalks became riddled with illegally parked private vehicles, street vendors, and commercial stock (Martin & Ceballos 2004). Starting in the late 1990's, former mayors Enrique Peñalosa and, later, Antanas Mockus, made the reclamation of public spaces a priority. Though their campaigns were at first not welcomed by low-income and high-income residents alike, they were gradually accepted as inhabitants started to acknowledge the benefits of these policies (Martin & Ceballos 2004). Apart from increased safety and better conditions for pedestrians, they also improved safety and travel speeds for private vehicle users.

Improving public space for pedestrians and cyclists was part of a larger plan to restructure the city's built environment and it was closely linked to the spatial framework implemented in 2000 (Salazar, 2008). The initiative was also presented as a first step to achieving an intermodal transport system that included high capacity buses, conventional buses, private cars, cycling and walking. In this sense, it paved the way for the construction of infrastructure-heavy public transport projects and also for the implementation of pedestrian-only roads in iconic zones in the city.

Source: (1) Martin G. & Ceballos M., 2004: Bogotá: Anatomía de una transformación – Políticas de seguridad ciudadana 1995-2003. Pontificia Universidad Javeriana. Bogota, Colombia. (2) Salazar J., 2008: Bogota 1992-2005 – The reversal of the crisis and the planning scheme. Megacities comparative study. Tokyo, Japan.

An integrated multimodal urban transport system : a key success factor

In African urban areas, the lack of coordination of public transport reduces its attractiveness and increases its overall cost, especially when operators unnecessarily compete with each other. Instead, by integrating or coordinating public transport modes, both transport authorities and users could benefit from economies of scale and the quality of service could be much higher. Integrated networks are synonymous with economic efficiency.

Integrating public transport supply is a strategic intervention, but, on its own, it is not enough. All components of the transport system, public and private, have to be considered and integrated as much as possible. Road based public transport requires stations easily accessible from both the road side and the pedestrian pathways. Dedicated public transport lanes might be needed, especially in the case of mass transit systems, imposing further constraints on the geometry as well as the operational aspects of the transport infrastructure, including traffic and parking management schemes. Thus,transport infrastructure and services need to be integrated right from planning to operating and maintenance.

Prior to the construction of the first LRT line in Tunis at the beginning of the 1980's, authorities conceived a fully restructured bus network, a new traffic master plan, and a public space enhancement plan for the city center, all integrated and implemented at the same time. The LRT was thus not only a transport project, but also one of the various components of an integrated urban development project. Another example of integration (Box 12) is provided by the city of Izmir (Turkey). It shows that integration is a long term process that involves many different synergistic measures to implement not only physical investments but also financial, organizational, and institutional changes.

Box 12: Izmir, Turkey, an early integration process

Since the early 1990s, the Municipality of Izmir, one of the main Turkish port cities, has strived to put in place a fully integrated transport system. It started by harmonizing public transport fares among the various modes of transport. Prior to the reform, users had to buy single-use paper tickets for their bus journeys, and a different ticket for ferry journeys, which meant a high cost for them. Then, the municipality created a system of electronic payment of transport services, the "Kentkart" card.

In 2000, the municipality launched its "transport transformation" program which aimed at improving integration between the various transport modes and making public transport – particularly by rail and sea – attractive in order to relieve the road network. Indeed, over the previous ten years, private cars had grown very fast and taken up increasing space in this Turkish city, exacerbating road congestion. In phase one of the program, buses and ferries were integrated into Izmir's public transport system. The Kentkart system also covered these two modes. In addition, bus fares were revised. The price was no longer fixed, but based on the distance travelled across up to four zones. The connecting bus routes were designed to offer a low-cost journey and link the transit hubs between the centers of activity, universities, shopping centers, new metro stations and ferries. The ferry fleet was expanded, and new wharfs and park-and-ride facilities were built. These reforms heralded the entry into service of a first 11.5 km long, light-metro line in May 2000.

A new fare policy was introduced in 2008 and further improved in 2010. In 2010, also, suburban trains were integrated into the system and joined the Kentkart scheme. This meant that, by that time, the entire public-transport system of Izmir was unified. Multimodal hubs have since multiplied. There are five connecting stations for ferry/bus, four for bus/metro, and sixteen for bus/suburban train. In 2012, the metro-line extension (2.3 km) entered in service. This has enabled the launch of phase two of the "transport transformation" project. In this phase, in particular, the bus network has again been redesigned in order to optimize integration of all modes.

According to the metropolitan transport master plan for the period up to 2030, Izmir plans to extend its suburban train network by 108 km and then to connect all industrial and all touristic sites. The municipality also plans to develop a modern tramway in order to reduce the number of buses on the roads. New embarkations will also be purchased to make the ferries more efficient. In addition, the municipality plans to upgrade bus stops with smart systems and integrate minibuses and taxis into the whole system. Finally, the municipality will take measures to reduce the share of cars in the modal mix.

Source: (1) C. Martinet, J. Allaire, 2012, CODATU Monograph, (2) A. Nalân Yetmen, 2011, Barcelona conference paper

Restructuring and modernizing bus systems is an immensely complex and difficult task

Acknowledging that few and notable exceptions exist, in most cases, current bus networks of urban Africa require urgent transformation. On one hand, formal bus services have experienced gradually reducing patronage and, as a consequence, companies struggle to maintain adequate levels of services and, in worst cases, they disappear from the city. On the other hand, usually starting from illegal services, informal private services have developed over time to be responsible for the bulk of urban public transport needs. However, their inherent characteristics of fragmented ownership, inadequate vehicle fleets, lack of service standards, and, sometimes, disruptive competition greatly hamper the overall system's performance.

In broad terms, two strategies for road-based system restructuring are possible. The first strategy seeks radical transformation of the existing system by rapidly implementing an overhaul program. This approach is extremely complex and requires substantial resources, and it is likely that several stakeholders will lose their place in the transformation. The example of Transantiago (Chile) shows the pitfall of such a strategy (Box 13). The second strategy aims at gradually developing and improving existing modes in order to allow both formal and informal-like services to evolve into each mode's envisioned part in an integrated system.

Box 13: Transantiago's (Chile) initially problematic implementation

The radical transformational approach followed by Santiago's authorities in restructuring their public transport system prioritized service optimization and converted the myriad of private operators into ten area-bound companies (that complement the five companies operating trunk lines), thus leaving outside the system several small private operators unable to form adequate operating companies. The initial implementation of Transantiago was very difficult and resulted in chaos as planning and operational failures had compounding effects. While elimination of disruptive competition on the road was indeed accomplished, it also resulted in unforeseen negative consequences pertaining to accessibility in the urban peripheries. Optimization reduced the number of routes and forced users to walk longer distances to find new public transport services (Forray & Figueroa, 2011). Users in lower-income areas were forced to alter their daily routines in order to adapt to the new bus services, sometimes even opting to seek different employment alternatives (Jouffe & Lazo Corvalan, 2010).

Source : (1) Forray R. & Figueroa O., 2011: Transantiago: La malograda promesa de modernizacion del transporte publico. http://www.ciudadenmovimiento.org/index.php. Visited July 2012. (2) Jouffe Y. & Lazo Corvalan A., 2010: Las practicas cotidianas frente a los dispositivos de movilidad. Revista EURE (Santiago) vol.36 no.108, pages 29-47.

In any case, bus network restructuring cannot only be concerned with the implementation of high-capacity mass transit networks; it also needs to promote the modernization of the existing informal system. This is especially relevant to urban Africa, where informal or paratransit services will likely continue to be key assets to the urban transport system in the near future. The example of Transmilenio (Colombia) shows that one-sided progress in mass transit can have negative consequences on the overall public transport system performance (Box 14).

Box 14: Unexpected effects of Transmilenio's implementation in Bogota, Colombia

Bogota's Transmilenio program, the highly praised BRT system of 2000 did effectively create an inflexion point in the city's transport system. It introduced urgently needed reforms and it also showed the possibilities of a BRT system challenging theoretical limits – in terms of capacity – of this mode of transport. Nonetheless, at the time, reforms focused primarily on the BRT high-capacity network and not on the entire transport system. Only selected operators were included in the process, leaving an important number of operators isolated from the program.

Indeed, without questioning the advantages achieved on Transmilenio's corridors in terms of operating speeds and congestion relief, implementation of the BRT also resulted in increased travel times and congestion levels on corridors not concerned by the program (Echeverry et al., 2005). A less than successful program to withdraw aging vehicles partly explains this dynamic. Vehicles excluded from newly implemented high-capacity corridors simply moved to other corridors instead of withdrawing from the system all together (Ardila Gomez, 2005). In all, excess focus of the new Transmilenio corridor hampered the program's ultimate impacts on the entire urban transport system.

Source: (1) Ardila Gomez A., 2005: La olla a presion del transporte publico en Bogota. Revista de Ingenieria no.21, pages 56-67. (2) Echeverry J.C.; Ibanez A.M. & Moya A., 2005: Una evaluacion economica del sistema Transmilenio. Revista de Ingenieria no.21, pages 68-77.

However, formalization of paratransit operators is an intensive and drawn out process, and catalytic projects (such as the implementation of BRT or other modes) do not support it unless paratransit reform is explicitly coordinated with progress in mobility improvement. Recognized as a necessity, paratransit reform requires sustained leadership and extensive communication between various stakeholders. The outcome of such a process can also change over time. The case of Quito (Ecuador) serves as an example of these complexities (Box 15).

Box 15: Quito's (Ecuador) multiple approaches to formalizing paratransit services

The implementation of BRT corridors in Quito between 1995 and 2004 necessitated different levels of formalization of paratransit services. On the first corridor, authorities decided to marginalize informal services by excluding them from operating the new system. They argued that negotiating a solution was unlikely and that this would result in the project being halted (Chauvin 2006). Analysis suggests that authorities might also have wanted to demonstrate that a BRT operation in the city was profitable (Salazar Ferro & Behrens 2013). This resulted in important citywide public transport protests directed at planning authorities and led by paratransit operators (Chauvin 2006). Ultimately, the armed forces were required to intervene and operations started afterwards.

A second, diametrically different, approach was chosen in the second BRT corridor of the city, the Ecovia network. Though negotiations were complex and initially a publicly owned company started operating the trunk route in the system, paratransit operators formed formal operating companies that eventually took over as the operators of trunk services (Hidalgo & Graftieaux 2006). Feeder services were, however, awarded to untransformed paratransit operators. This created significant operational issues between trunk and feeder services as paratransit operators did not necessarily maintain their frequencies and schedules (Salazar Ferro & Behrens 2013). Later BRT corridors relied on yet other strategies to for-malizing paratransit operators.

The Quito case demonstrates that formalization of paratransit services comes at political and social costs and that acknowledging the contextual conditions is required when introducing formalization approaches.

Source: (1) Chauvin J.P., 2006: Conflictos gobierno local: El caso del transporte urbano en Quito. Masters dissertation. Facultad Latinoamericana de Ciencias Sociales. Quito, Ecuador. (2) Hidalgo D. & Grafiteaux P., 2006: A critical look at major bus improvements in Latin America and Asia, Case study Metrobus-Q, Quito, Ecuador. EMBARQ. Washington D.C., United States. (3) Salazar Ferro P. & Behrens R., 2013: Paratransit and formal public transport operational complementarity: Imperatives, alternatives and dilemmas. WCTR Conference. Rio de Janeiro, Brazil.

In all, bus restructuring programs require substantial prior studies that sufficiently diagnose needs and that support the vision for an integrated public transport system. Implementation is to be strategic and it should aim to gradually reform the entire public transport supply. In particular, cost and quality trade-offs need to be studied, as well as the possibilities for contracts between authorities and operators that can support operational complementarity between publicly supplied and private services.

Adequate road infrastructure requires substantial resources and a clear allocation of responsibilities

Within a fair degree of variability between African cities, key infrastructure projects tend to focus on primary roads, where demand is highest. Secondary roads within neighborhoods, especially those at the urban periphery, often suffer most from un-

derfunding. Further complicating these issues, informal urban areas continue appearing and expanding, and road maintenance and construction struggles to keep up.

Dar es Salaam, which displays a recognized lack of adequate infrastructure, illustrates a number of these issues. The substantial quality differences between primary and secondary roads further exacerbate the infrastructure problems of the city. Indeed, secondary roads lack minimal maintenance partly because three concerned municipalities that do not have the necessary budget share upkeep responsibilities. This situation, coupled with significant informal territorial growth, explains the complexity of road planning, construction and maintenance throughout the urban area. Other cities in the developing world experience similar difficulties. In Peru, Lima's case depicts some of the challenges well known in most urban areas of Africa (Box 16).

Box 16: The shortcomings behind Lima's (Peru) poor secondary road infrastructure

Lima's road network's backbone is a primary road network radial in shape. Its focus is the historical center from where important arteries reach the peripheries of the city. Next to this network, the secondary road network, which has a far more complex shape, provides accessibility to all neighborhoods but seldom supports high capacity traffic. This network has important deficiencies that hamper the city transport system (CAF 2010).

Amongst a myriad of problems affecting the secondary road network that range from lack of bridges crossing rivers of the city to unsolved intersections and lack of continuity of several streets, two problems appear symptomatic of Lima's less than adequate road infrastructure (Avellaneda Garcia 2007). First, the poor maintenance of secondary roads is evidenced throughout the urban territory. Deteriorating pavement is common and this results in drastically reduced speeds and elevated costs of vehicle maintenance. Related to this lack of effective maintenance, it is also important to note that in informal settlements of the peripheries the road network is largely unpaved (Avellaneda Garcia 2007). Large public transport vehicle access to these areas is, as a result, problematic. Similarly, in mountainous areas of Lima, due to their difficult geographical and topographical characteristics coupled with lack of maintenance, formal public transport availability is limited and its general performance is unsatisfactory (Vega Centeno 2009).

The second important problem is the general lack of coordination between public entities in charge of road infrastructure. In Lima, the national government, the province of Lima, the province of Callao and a multitude of local administrations, which are all involved with road infrastructure, seldom coordinate their actions. Even if it is fairly accepted that large scale planning is the role of a metropolitan authority, the definition of responsibilities is unclear resulting in duplication of functions and abandonment of responsibilities evidenced by the general inadequate state of secondary road infrastructure (Avellaneda Garcia 2007; CAF 2010).

Source: (1) Avellaneda Garcia P., 2007: Movilidad, pobreza y exclusion social – Un estudio de caso en la ciudad de Lima. PhD dissertation, Universitat Autonoma de Barcelona. Barcelona, Spain. (2) Corporacion Andina de Fomento (CAF), 2010: Observatorio de movilidad urbana para America Latina. Corporacion Andina de Fomento. Bogota, Colombia. (3) Vega Centeno P., 2009: Movilidad cotidiana y segregacion social en Lima. Departamento de Arquitectura – Pontificia Universidad Catolica del Peru. Lima, Peru..

Mitigating the negative impacts and externalities of transport

Sharing the streets to improve road safety

While the poor state of transport infrastructure in African cities is undoubtedly an important contributor to road safety problems, poor driving practices of formal and informal public transport operators alike also contribute to the high incidence of accidents and fatalities. Old or not roadworthy vehicles and a lack of passenger safety features on these vehicles are further contributing factors, as are significant speed differentials and poor traffic law enforcement. Buses, minibuses, shared taxis and, more recently, motorcycle-taxis compete with private vehicles for limited road space. Pedestrians and cyclists are also often forced into that same road space. The result is a myriad of speeds and modes on a limited road width leading to high accident and fatality rates. The example of large Indian cities, in Box 17 below, indicates that initiatives based on infrastructural upgrades to reduce the problematic differences in speeds are part of the solution.

By adopting urban road safety policies that take into account the needs of all users and in particularly the most vulnerable road users, and implementing these policies by retrofitting existing roads whenever necessary, cities of the developed world have enhanced safety conditions for all. In Africa, some cities have moved along a similar path. Nairobi authorities, for example, have attempted to establish an effective road safety management system by enforcing a set of rules in the paratransit sector although they have achieved only mixed results. Indeed, while some success was obtained by changing the perception that users have of public transport, the minibus drivers have not shown significant improvements in their generally dangerous driving behaviors.

Box 17: Increasing motorized vehicle usage and road safety problems in Indian cities

In India, deadly road traffic crash numbers have continuously worsened in recent years. Partly explained by a fast growth in the number of vehicles on the road, fatality rates increased from 36 deaths per one million people in 1980 to 95 deaths per one million in 2006 (Mohan et al. 2009). The situation in several cities is far more problematic than elsewhere in the country; for the same year, in Delhi, the rate was 140 fatalities per one million inhabitants (Mohan et al. 2009).

As in many cities of the developing world, because of differences in mode speeds and the lack of rules and facilities, or just improper drivers' behavior for sharing road space, non-motorized modes are more often than not the most vulnerable as illustrated in the following table.

Table 6. Fatalities per transport modes in Delhi and Mumbai

Fatalities per mode (Percentage)	Delhi 2001-2005	Mumbai 1996 - 1997
None-motorized modes	61%	86%
Pedestrians	47%	79%
Bicycles	10%	7%
Other	3%	0%
Motorized two-wheelers	26%	7%
Bus	4%	0%
Cars	3%	2%
Three wheelers (motorized)	3%	4%
trucks	3%	2%
Other motorized modes	1%	0%

Note: Rounding of data might result in total not being exactly 100%. (Source: Mohan et al. 2009)

Several measures have been put forward in order to protect the most vulnerable road users in these cities and reduce the continuously increasing fatality rates. Analyses have been carried out to identify those measures that are likely to have the more substantial positive effects. From a large list of options, separation of traffic on arterial roads and traffic calming in key areas were selected based on their high potential for positive impact. They both represent main infrastructural amendments to the current use of road space. (Mohan et al. 2009).

Source: (1) Mohan D., Tsimhoni O., Sivak M. & Flannagan M.J., 2009: Road safety in India: Challenges and opportunities. University of Michigan – Transportation Research Institute. Ann Arbor, United States.

Reducing pollution through car ownership control and / or limitations to car use

The unchecked urban sprawl seen in many urban areas of Africa is one of the factors behind the continuous growth of motorized transport, especially where walking and cycling are not feasible options. However, inadequate vehicle maintenance, poor fuel quality and aging vehicle fleets also bring with them in-creased air and noise pollution.

Both in developed and developing countries, the automobile plays a key role for economic development. Even beyond mobility needs, there is a social demand for private vehicles that offer potential freedom and flexibility to travel anywhere anytime and serve as a representation of personal success. So it is tempting and it feels "natural" for political leaders to choose car-based development patterns and more often than not to promote the automobile. Only later, once facing congestion, decision-makers develop alternative transport policies attempting primarily to reduce car (or motorbike) use, often avoiding constraints on car (or motorbike) ownership.

Some countries or cities have implemented instruments to control motorization growth, considering that vehicle ownership is closely correlated to car (or motorbike) use. In some cases, fiscal instruments or norms are set up to control owner-ship of bad quality car (or motorbike). Such policies usually require the existence of well-performing public transport services to provide adequate alternative accessibility to all.

As motorization rates are still low in the vast majority of African countries, policy makers still have the opportunity to consider the two options to reduce car use – by control of vehicle use and/or control of vehicle ownership – in order to reduce air and noise pollution.

License plate auction systems in Shanghai and Singapore or car ownership taxes in Denmark, Japan, or Turkey are good examples of ownership control (Box 18). With respect to car use control, typical mechanisms (Box 19) are prohibition of the use of vehicles on particular weekdays based on the license plate numbers (e.g. Tehran), congestion charges (e.g. London or Milan), or simple stiff tax on gasoline purchases (e.g. Turkey). These instruments could be used to fund the development of public transport systems.

Box 18: License plate auction system in Singapore and Shanghai (China)

In 1990, Singapore launched its Vehicle Quota System (VQS) to curb the growing private vehicle fleet. Every six months, the Land Transport Authority (LTA) determines the number of licenses (called Certificates of Entitlement, or COEs) that can be issued to maintain the desired vehicle fleet size. COEs are then put up for auction on a fortnightly basis. The COE is valid for 10 years and may be renewed by paying the average auction price three months prior to its lapsing.

The city of Shanghai launched a similar system in 1994, but without specific vehicle category quotas. Prospective vehicle license holders must register with the authorities, and may then participate in auctions that are held online on a monthly basis. In April 2013, 11 000 plates were auctioned at an average price of € 10 000 each. Given the surge in prices, the authorities later introduced auction price ceilings as well as a distinction between private vehicles and company vehicles. In both the above cases, the auctioning system limits the rate of motorization, while the proceeds from the auctions contribute towards funding public transport.

Box 19: Milan's (Italy) eco-charge - moving towards congestion charging

Milan's congestion charge was introduced in January 2008 to tackle pollution by charging drivers of the worst offending vehicles a variable toll to enter the city center. The daily congestion charge applied between 7 am and 6 pm, costs between €2 and €10 depending on how polluting the vehicle was (with reference to European standards) and at what time of day the vehicle entered the zone. Monthly passes were charged according to the level of pollution a vehicle emitted, costing between €50 and €250. Two months after the tax was introduced, the number of commercial vehicles entering the zone had dropped by 30% and traffic composition was significantly altered. As a result, however, more and more vehicles were given free access to the zone and the city center therefore ended up with traffic levels similar to those recorded in 2007.

At the beginning of 2012, a new initiative (known as Area C) was put in place on an 18 month trial basis. The zone covers the city center (8.2 km2) and is accessible via 43 entry points covered by surveillance cameras. The daily rate applicable from 7.30 am to 7.30 pm is €5. Residents are allowed 40 free entries and beyond that have to pay €2. City center access is free for motorbikes and scooters, as well as vehicles with electric, hybrid, biofuel or natural gas engines. On the other hand, vehicles with Euro 0 petrol and Euro 1, 2, and 3 diesel engines are not allowed access to the city center. Traffic in 2012 fell by a third in the Area C zone and even traffic outside the zone has fallen as a result of the trial. In 2012, the program brought in €20.3 million which is €13 million net. €10 million were invested in order to develop the metro and bus network services, whilst the remaining €3 million allowed the development of the self-service bicycle system.

Source: http://www.comune.milano.it/portale/wps/

Better accessibility for all : Saving time and money

In most large cities, the growth of the demand for urban mobility has induced longer travel distances, a far greater number of motorized trips, and congestion. As a consequence, inhabitants of these cities, especially the poorest, suffer from a dramatic increase of daily time and expenses dedicated to travel, especially for commuting. Improving accessibility requires to control/reduce travel costs, especially for the poorest, while limiting the daily time spent for mobility. Box 17 illustrates a successful example of improving accessibility in Jakarta.

Box 20: Concrete time reduction of trips in Jakarta (Indonesia)

The Transjakarta BRT began operations in 2004. It aimed to reduce congestion in the city by offering an efficient public transport system. It carried more than 16 million passengers during its first year of operation. Traffic continued to increase in 2005 to reach more than 20 million passengers. On the BRT corridor, accessibility has dramatically improved for residents. A study conducted by the Institute for Transportation Studies (INSTRAN) revealed that journey times were sometimes divided by two, compared to other modes. 65 % of the users choose the BRT system because of time saving. Despite a lack of organization of interchanges, Transjakarta has attracted many users, including some from private transport modes (about 20 %). After six years, Transjakarta's network has grown to more than 120 km, serving 8 corridors.

Source: (1) Dirgahayani, P., Harata, N., & Ohmori, N. (2007, August). Barriers towards intermodality for pursuing to-work commuters' modal shift to bus rapid transit system in Jakarta, Indonesia. In THREDBO 10: The international conference on competition and ownership in land passenger transport (pp. 12-17).(2) Kumar, A., Zimmerman, S., & Agarwal, O. P. (2012). International Experience in Bus Rapid Transit Implementation: Synthesis of Lessons Learned from Lagos, Johannesburg, Jakarta, Delhi, and Ahmedabad.

Overcoming common barriers to sustainable urban accessibility and mobility

Successful and failed attempts at improving urban mobility point to common barriers that need to be overcome, from conception to implementation, in order to ensure viability of policies in favor of sustainable urban mobility.

Some of the most common barriers identified in Africa as well as in other regions of the World are well documented and are also apparent from the examples high-lighted in the previous sections:

- Lack of awareness and political will,
- Unclear responsibilities, lack of coordination and predominance of short-term individual interests,
- Scarce human resources, know-how and data, and
- Scarce financial means.

The lessons from international experience also provide some guiding principles to help overcome these barriers:

- Lack of awareness and political will => Improve understanding of key urban accessibility and mobility issues and of actual levers for action in order to generate strong and sustained commitment from decision-makers.
- Unclear responsibilities, lack of coordination and predominance of short-term individual interests => Put in place a well-conceived governance framework and a clear decision-making process, enforced through proper legislation, favoring integrated trans-sectoral and multimodal approaches, cooperation, and systematic accountability.
- Scarce human resources, know-how and data => Build capacity of a sufficient number of well trained and experienced professionals able to conceive, implement and monitor data informed policies, strategies and projects, according to internationally recognized best practice and locally suited norms and practices.
- Scarce financial means => Implement appropriate funding mechanisms to sustain efficient and inclusive urban transport.

Building on these principles and on the key lessons from international experience highlighted in the previous sections, the following chapter focuses on the development of a vision for sustainable accessibility and mobility for African urban areas and on the formulation of a set of specific policy recommendations.

4. Policy recommendations to achieve sustainable accessibility and mobility in urban areas of Africa

Framing the vision

Prior to defining policy recommendations, it is crucial to define a clear and comprehensive vision of sustainable mobility and well-performing transport systems in African urban areas, so that all inhabitants benefit from adequate access to essential services and opportunities, a key contributor to decent living conditions.

Such a vision is proposed below, outlining critical qualities that the main components of an urban transport system should possess.

- All *users* and *economic stakeholders* have universal access to an efficient and affordable transport system, are aware of their rights and obligations when using public space, are conscious of the risks and effects of their travelling, especially those related to public health and the environment, and are provided with the possibility to participate/contribute to the development of the transport system.
- The *urban territory* is laid out in such a way as to bolster accessibility, quality of life, economic competitiveness and social inclusion, while at the same time preserving natural resources. Urban form and land use minimize the number of passenger and commercial trips, travel distances, as well as all costs associated with transport infrastructure and transport services.
- *Public space allocated to mobility* is equitably shared among the various transport modes, with particular care given to pedestrians and public transport services. In the developing areas of the agglomeration, enough public space is allocated for predictable increase in traffic volumes for all transport modes, and for parking needs.
- *Transport infrastructure* (roads, streets, railways, bus-exclusive infrastructure, waterways, transport interchanges, etc.) allows for safe and effi-

cient travel (continuity and fluidity), while at the same time preserving the surrounding living environment. Transport infrastructure is resilient to climate change.

- *Transport services* are efficient and financially viable, and provide access for all to the entire urbanized territory, in particular for the most vulnerable users.
- *Safe and clean vehicles* display low energy consumption and low carbon emissions, and reduce road safety-related risks to vehicle occupants and to all other users.

All above mentioned components maximize positive social and economic impacts while minimizing negative environmental impacts, thanks to coherent, efficient, well-informed and well-funded interventions and regulation ensured by knowledgeable and accountable *public institutions*, serving the general interest.

In order to give effect to this vision, a conceptual framework for action is developed in the following section, meant to ground and guide public action towards enhanced accessibility and sustainable mobility in African urban areas.

"EASI" – a robust conceptual framework to guide public action

The identification of key issues and the formulation of the vision presented above clearly illustrate that the improvement of urban accessibility and mobility is a complex challenge that requires the mobilization of multidisciplinary means cutting across several areas of work. It is therefore necessary to design a broad and holistic framework that responds to the complexity of the challenges at hand. Such framework should encourage the participation of all stakeholders in the pursuit of a set of shared goals and outcomes.

Built around four levers of intervention, the conceptual framework proposed in this paper integrates two main dimensions: on the one hand, the governance system and, on the other hand, the urban transport system itself.

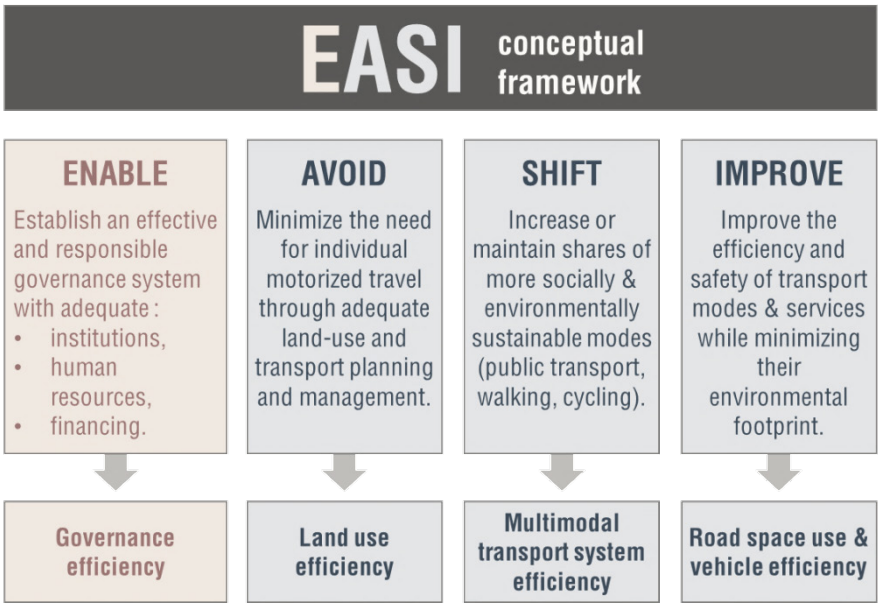
Synthetized by the verb "Enable", the first lever of intervention focuses on the enabling environment for a sound urban transport governance system. The other three elements of the framework are "Avoid", "Shift" and "Improve", and they refer to the main levers of intervention on the urban transport system.

These four elements form together the cornerstone of the "EASI conceptual framework", each being associated to a particular set of objectives that are presented below:

- *ENABLE.* To establish an efficient and responsible governance system, capable of anticipating needs, guiding action and ensuring integrated management and development of the urban transport system,
- *AVOID.* To minimize the need for individual motorized travel through adequate land-use and transport planning and management,
- *SHIFT.* To increase or maintain the modal shares of public transport and non-motorized transport modes, such as walking and cycling,
- *IMPROVE.* To improve the efficiency and safety of transport modes while minimizing their environmental footprint.

The EASI conceptual framework is schematically presented below.

Figure 6. EASI, a conceptual framework to steer public action towards sustainable accessibility and mobility in African urban areas



Box 21: From ASI to EASI

The "EASI conceptual framework" presented in this paper is both an extension and an adaptation to the case of emerging countries of the earlier and well known "Avoid-Shift-Improve" concept (as depicted for instance in the GIZ factsheet "Sustainable Urban Transport: Avoid-Shift-Improve", December 2013).

The initial "Avoid-Shift-Improve" concept focuses primarily on energy efficiency, with roots that are primarily adapted to developed economies with high motorization rates.

In the initial concept, the "Shift" element seeks to enact a substantial modal shift that awards priority to active modes and/or public transport; it is founded on the underlying premises that initial motorization rates are high and consequently the modal share for individualized motorized modes is (too) important. This basic assumption on motorization rate is not found in the current situation of most African
urban areas.

Those are characterized by an evident dependency on walking and on public transport services (privately and publicly operated) and by the lack of alternatives to those modes. Furthermore, African urban areas are also characterized by significantly lower motorization rates than those of Europe or North America. The differences in terms of context explain the variation in the interpretation pertaining to the "Shift" component and the importance given to NMTs, to the improvement of safety and comfort levels and to enhanced performance of transport infrastructure and services.

Also, through its first dimension, the "Enable" pillar, the EASI conceptual framework gives preeminence to the substantial preconditions and efforts that are required, at governance level, to ensure the provision of sustainable urban transport systems.

Structured around the four components of the EASI conceptual framework, this chapter develops a set of twenty policy recommendations aimed at policy- and decision-makers in charge of urban areas and transport systems in Africa.

For each of the four levers of intervention, a brief section introduces a set of specific policy recommendations, highlighting challenges at hand and/or providing links either to the current situation observed in urban areas of Africa or to lessons from international experience. Each of the policy recommendations is subsequently developed, all of them forming a coherent and indivisible package that requires simultaneous consideration and implementation.

Enable

To establish an efficient and responsible governance system, capable of anticipating needs, guiding action and ensuring integrated management and development of urban transport systems.

The analysis presented in Chapter 2 has shown a clear correlation between urban transport performance and governance. Indeed, urban areas that perform best, such as those of South Africa have the strongest governance systems. Poor governance, on the contrary, is almost always associated with serious inefficiencies in transport services and unsatisfactory access to the amenities that the urban population requires. This is no surprise. Urban transport systems are complex and require consistent actions by multiple actors. They are also influenced by urban development processes which are even more complex and difficult to control. Furthermore, they require key decisions to be taken at local level, a level that has often been neglected by central governments and has not received the human and financial resources that it needs. There are many countries and cities in the world, however, which have been able to tackle these issues and give themselves the institutional capability to better plan and manage their urban transport systems. The following table presents seven policy recommendations to help African cities emulate these good practices. Each of these policy recommendations is further developed hereafter.

Table 7. Policy recommendations materializing "Enable"

E1	To define, adopt and implement, at central government level, a **national urban transport strategy** that ensures the sustained development and management of urban transport systems.
E2	To ensure that the main urban transport public responsibilities at urban/metropolitan level are assigned and carried out.
E3	To set up an **entity in charge of urban transport** planning and of guiding and coordinating public action aimed at the provision of a multimodal urban transport system.
E4	To provide all institutions and stakeholders in the urban transport sector with adequate **human resources.**
E5	To increase **financial resources** allocated to urban transport systems and to ensure the availability of long-term funding for urban transport.
E6	To create the preconditions for continued **civil society** participation in the development of urban transport systems.
E7	To enhance the involvement of the **private sector** in the provision of transport infrastructure and services.

Recommendation E1 – To define, adopt and implement, at central government level, a national urban transport strategy that ensures the sustained development and management of urban transport systems.

Providing adequate accessibility and mobility to all urban dwellers by means of a sustainable urban transport system does not only depend on decisions taken, and resources mobilized, at the local level of a city or an urban region. Much also depends on policies and means usually decided and managed at national level. Typically, key factors include institutional, legal, regulatory, fiscal and financial frameworks.

It is therefore recommended to establish a national urban transport strategy, that ensures the adequate involvement of all stakeholders – public and private – in the development and management of urban transport systems, sets a vision, fundamental principles and specific priorities, and allocates responsibilities and resources.

In this context, national level decision-makers should carry out the following tasks:

- describe and diagnose the initial formal and functional institutional framework in relation to accessibility and urban transport systems' management, with a view to detect gaps and ambiguities that may be sources of inefficiency, tensions or risks to the adequate provision of ur-ban transport;
- design strategic objectives, organizational arrangements, indicators and guidelines to steer public action in support of accessibility and urban mobility improvements;
- continuously review and refine the mission of public entities, and the resources allocated to them, so that roles and responsibilities are efficiently assigned between the various government institutions involved in urban transport governance and management, and mechanisms are in place to provide them with adequate resources; and
- if deemed appropriate, identify the need to reform the political, legislative and financial organization in order to better align with, and support, the functioning of the urban transport governance and management system. This step guides implementation of actions associated to the other recommendations E2 to E7 to provide the enabling environment for a sound urban transport governance system.

In carrying out these tasks, the following aspects should be given particular consideration:

- *Aims of a national urban transport strategy.* The definition of a national strategy for urban transport is a way to acknowledge the importance of accessibility and urban transport, and their contribution to sustainable urban development. A national urban transport strategy should guide public action for the development and management of urban territories and urban transport systems. The strategy should set out clear goals and guiding principles, and define formal organizational arrangements for implementation.
- *Crosscutting integration.* A national urban transport strategy should seek adequate integration of the many parallel sectors involved (territorial planning/urbanism, environment, energy, economy, tourism, etc.). Policy integration should result in improved coordination and coherence of visions, plans, budgetary programs, norms, standards and control systems. This requirement is further elaborated upon in the section pertaining to integrated urban planning (cf. "Avoid" section).
- *Institutional coherence.* A national urban transport strategy should clearly outline the conditions for optimized coordination, vertically and horizontally, between all institutional bodies involved, at central and local levels. The principles of subsidiarity and proximity should apply, favoring local decision-making whenever possible, and ensuring central decision-making whenever needed.
- *Adequate resources.* A national urban transport strategy should ensure that adequate human and financial resources are made available to rightfully develop, manage and operate urban transport systems. The importance of this requirement justifies the two specific policy recommendations presented below (cf. E4 & E5).
- *Enhanced participation of civil society.* Public authorities are accountable to civil society, who is the main beneficiary of public action in favor of improved urban mobility and accessibility. In turn, participatory approaches can greatly benefit the planning process, from the earliest stages of conception down to the implementation and operation of transport solutions, thanks to greater ownership. A national urban transport strategy should therefore clarify the roles and rules of civil society involvement. A specific policy recommendation is further developed below (cf. E6).
- *Increased participation of the private sector.* The private sector should be considered as an important partner to develop and operate urban transport systems, even more so in a context of scarce financial means. A national urban transport strategy should therefore delineate roles and responsibilities be-

tween public and private sectors, and highlight opportunities for the private sector while at the same time providing explicit conditions for equitable and transparent access to commercial opportunities (cf. E7).

- *Importance of data.* Reliable data collection, databases, data analyses and data sharing methods should constitute a primary concern for urban transport policy- and decision-makers in Africa. A national urban transport strategy should define a methodological framework and incentives to ensure regular provision and storage of relevant and reliable indicators concerning urban mobility and transport. Open data could and should be seen as an opportunity to overcome the lack of data in Africa.
- *Stakeholder involvement and commitment.* A structured process for the development of a national urban transport strategy should seek the involvement of all relevant stakeholders in an orderly fashion. Experience shows that political leadership and adequate time are two factors required for the proper development of a national urban transport strategy. The design process is probably equally as important as the output itself, since one of the desired outcomes should be the commitment of all stakeholders.

Recommendation E2 – To ensure that the main urban transport public responsibilities at urban/metropolitan level of government are assigned and carried out.

The following responsibilities have a strong impact on the accessibility and mobility conditions supplied by an urban transport system; these responsibilities should be specifically recognized and assigned in each urban or metropolitan area in Africa:

- *Urban development and transport planning,* a comprehensive discipline that encompasses and integrates all sectoral planning and programming efforts at metropolitan level, incl. territorial planning, socio-economic planning, environmental planning and, programming of transport infrastructure and services (cf. specific recommendations detailed in the "Avoid" section).
- *Land use regulation and control,* an essential and operational extension of urban planning. Land use regulation and control is a major challenge for most national and metropolitan authorities in Africa. A vital mission, it is particularly important to control mobility needs as well as to prevent risks and leverage opportunities that reside in the integrated development of urbanization and transport system (cf. specific recommendations proposed and detailed in the "Avoid" section).

- *Development and management of public space and transport infrastructure,* mainly through traffic and parking management (regulation and enforcement of road usage, fixed and variable traffic light management, etc.), public space construction and equipment (road construction, supply and implementation of traffic lights, public lighting and urban accessories, urban design, etc.), and public space maintenance (cleaning, rehabilitation and renewal) (cf. specific recommendations proposed and detailed in the "Avoid" section).
- *Regulation and control of transport services,* particularly of urban passenger transport services, through definition of operating conditions, fare management, contracting and/or licensing of public and private operators, monitoring of operating arrangements, and revenue or subsidy management if applicable (cf. specific recommendations proposed and detailed in the "Shift" section).
- *Car fleet regulation* related primarily to technical aspects of vehicles in order to ensure safety and reduce car emissions (cf. specific recommendations proposed and detailed in the "Improve" sections), a responsibility usually carried out by the central governments. Certain African countries should not exclude the possibility to consider car fleet regulation as a way to regulate car ownership with the aim of reducing car use.
- *Public communication and urban transport information management,* through open and regular dissemination of reliable and pertinent data on transport supply and demand and through dialogue with the various private and public stakeholders. This function is directly related to transparency and decision-makers' accountability towards city dwellers.

It is the responsibility of public authorities to ensure that the above functions are clearly identified and assigned, i.e. through institutional mapping. This can require reforms of certain institutions, coupled with the reassessment of planning processes, legislative and regulatory frameworks and contracts with public and/or private operators and/or the need to make available or to reallocate more human or financial resources.

Recommendation E3 – To set up an entity in charge of urban transport planning and of guiding and coordinating public action aimed at the provision of a multimodal urban transport system.

Depending on the geopolitical context and the maturity level of its public institutions, each urban/metropolitan area should set up an urban transport planning and coordination body[2]. Such entity may assume various responsibilities and forms and it should be capable of evolving over time (the notion of gradual empowerment is therefore applicable to bodies of this nature).

Fundamentally, any type of urban transport planning and coordination body should be responsible for *two main tasks:* firstly, to act as the locus for a coherent, explicit and legitimate vision of a multimodal transport organization; and, secondly, to ensure coordination of public action in support of the development and management of the urban transport system.

Based on lessons drawn from recent international experience, guidance to create such entities is provided below focusing on the implementation and adequate functioning of the transport planning and coordination mission.

- *Territorial competence.* The jurisdiction and competence of urban transport institutions should overlap with human settlement, economic activity and daily trip patterns. Often the political and administrative boundaries do not correspond to these patterns. This means that urban transport institutions will often have to transcend political and administrative boundaries.
- *Mission or core business to be assigned to the urban transport planning and coordination body.* In direct link with the key tasks depicted above, the four main elements of the mission to be assigned to the urban transport planning and coordination body are: (a) medium-term infrastructure and transport service *planning,* which necessitates integration with other sectors of urban development; (b) short- and medium-term *programming and budgeting* of priority investments for the development and management of the transport system[3] ; (c) *regulation and control of public transport services,* mainly in the

[2] The institutional body's name is secondary to the implementation of recommendations presented in this report. Generally, the body's name uses the terms urban or metropolitan transport authority. During the last decades, a few planning and coordination bodies have been set up in Africa: CETUD (Conseil exécutif des transports urbains de Dakar), AGETU (Agence des transports urbains d'Abidjan), LAMATA (Lagos Metropolitan Area Transport Authority), AODU (Autorité organisatrice des déplacements urbains de Casablanca).

[3] As much as possible, the planning and coordination entity should have a central role when defining resource allocation to the various other departments or agencies involved in the execution of transport infrastructure programs.

form of management of contracts and/or operating licenses; and (d) continuous *monitoring* of transport supply, demand and impacts, as well as supervision and evaluation of public action in this field. The latter element requires that the institution perform as an urban transport observatory.

- *Human resources.* Urban transport planning and coordination bodies should possess adequate human resources, in terms both of number and competence. This is often a critical issue in Africa, which requires strong efforts to build capacity.
- *Funding.* Funding should be made available in a sustainable manner for the operations of the urban transport planning and coordination body. Funding is a vital challenge. Its deficiency is one of the main causes of the fragility of the limited number of urban transport institutions created over the past 15 years on the African continent (e.g. in Lagos, Abidjan, Dakar, Gauteng or Casablanca).
- *Legal form.* The legal form of the urban transport planning and coordination entity should allow involving all relevant levels of public authority (e.g. municipal, departmental, regional and/or national levels) in the decision-making process. Depending on its assigned scope, the planning and coordination entity should be endowed with sufficient political powers. It will also be beneficial if this entity is autonomous in financial terms in order to be able to recruit highly competent personnel.

In establishing urban transport institutions, it is essential that the legislative provisions of the specific country, including the prevailing inter-governmental powers, duties and fiscal frameworks, be taken into account. It may be necessary to plan for the gradual evolution of urban transport institutions over time.

Recommendation E4 – To provide all institutions and stakeholders in the urban transport sector with adequate human resources.

Every stakeholder and decision-maker in the urban transport system should have the competence to deal with his/her assigned responsibilities:

- political authorities need to be sensitive to accessibility and urban transport challenges; they also need to have sufficient expertise to understand the impacts of their decisions;
- urban transport entities should have the requisite human capacity to execute their respective mandates;

- public and private operators involved in the urban transport system should possess sufficient technical and organizational capacity to supply appropriate services (passenger or freight, transportation, construction and/or implementation of transport infrastructure); and
- users and city dwellers in general should have the minimal knowledge to be able to utilize, safely and appropriately, transport modes and urban public space. Knowledge includes recognizing risks, especially those pertaining to road safety. Efforts in this respect should be focused on school programs and communication/public awareness initiatives.

Considering the current situation of most public entities responsible for management of urban territory and transport in Africa, the following actions are necessary:

- enhance the existing personnel's competences through continuous training on accessibility and mobility challenges, alternative methods of transport service provision and integrated planning, programming, and management tools for urban transport (development and operations, infrastructure and services, public and individual transport, urban planning and urban design, etc.);
- expand human resources, specifically to lead urban transport planning and monitoring, public transport operations and road management, in coordination with the relevant institutions;
- improve knowledge transfer, and review and improve certain work processes, ensuring adequate contractual mechanisms with the private sector, as well as active participation in international professional networks; and
- set up and support technical/graduate-level educational programs to train young staff and contribute to research in the fields of accessibility and urban transport. Such initiatives require sustainable funding.

Recommendation E5 – To increase financial resources allocated to urban transport systems and to ensure the availability of long-term funding for urban transport.

In Africa, the urban transport sector is substantially underfunded. Additional funds should be mobilized and sustainable funding mechanisms put in place.

Besides reallocation and increase of existing funds in favor of urban transport (including fuel and vehicle registration taxes), various additional funding sources should be considered to expand available means. Among them are:

- the introduction of urban tolls for certain roads or parking fees;

- contributions by employers and commercial activities;
- land value capture in areas served by transport services, mainly through a strategy to buy land in advance and to capture land value increases resulting from public investments;
- private sector funding options made available either through urban development operations or real estate projects, or through transport infra-structure projects, at building and/or operating levels; and
- climate finance, e.g. through NAMA's (Nationally Appropriate Mitigation Actions).

Depending on the fare policy, public funds may be required to cover the gap between operational costs and revenues. Sufficient funds are also necessary to maintain transport infrastructure. These requirements added to investments should be taken into account when evaluating funding needs. Careful attention should be paid however not to create long-term financing mechanisms for short-term expenditures.

In the Kingdom of Morocco, the 2014 Finance Law greatly strengthened an existing special fund for road-based urban and interurban transport, seeking to anticipate part of the future funding needs for mass transit. The Moroccan national government estimates that, in the coming decade, its main metropolitan areas will have to invest approximately 30 billion dirhams (or roughly 3.6 billion USD) to develop mass rapid transport networks. This amount includes infrastructure costs and the necessary funds to cover the anticipated operational deficit for initial years of service. .

The role of development partners and the emergence of environmental and carbon-related funding mechanisms should also be highlighted. Local and national governments should join forces in identifying their needs and tapping such funding opportunities. At the same time it is acknowledged that capacity needs to be built in the areas of providing and accessing to sustainable funding for urban transport where few experience exists in Africa.

Recommendation E6 – To create the preconditions for continued civil society participation in the development of urban transport systems.

At present few countries and cities in Africa have implemented mechanisms to openly and regularly involve civil society in the process of designing and implementing accessibility and urban transport solutions. This is a major shortcoming if one considers that civil society is a precious source of information on needs and potential transport solutions. Moreover, consulting with and regularly reporting to civil society increases

legitimacy of decisions taken, through stronger ownership. This also promotes transparency, ensures better accountability, and is often critical for quality of projects and speed of implementation.

Therefore, it is strongly recommended to reinforce the involvement of civil society and of major urban stakeholders (neighborhood representatives, religious leaders, businesses, associations, investors, etc.). Even if participatory and consultation processes or "co-construction" processes are not easily implemented and maintained, they constitute a real opportunity and a strong requirement for decision-makers.

Prior to taking initiatives, public authorities need to conceive clearly structured, tailor-made and long-term processes for civil society involvement, with explicit rules that will likely need to be publicized as often as necessary. Particular attention should be given to communication tools that need to fit all partners involved.

Recommendation E7 – To enhance the involvement of the private sector in the provision of transport infrastructure and services.

In terms of operational flexibility, commercial dynamism, focus on results, and financial capacity, the private sector holds some key advantages over the public sector when it comes to carrying out complex, risky, and management intensive commercial activities such as those in the urban transport sector.

Therefore, public authorities are likely to gain much from actively involving the private sector in the actual operation and/or financing of major parts of the urban transport system.

For such involvement to be successful, however, it is critical that the manner in which the private sector is engaged takes place within a clear regulatory framework that gives priority to the general interest over particular interests, ensures transparent access to public tenders, and provides for well defined, measurable and manageable commercial risks, as well as rights guaranteed by independent jurisdictions.

It is the responsibility of decision-makers to define and implement such a regulatory framework, with appropriate oversight measures, which may require changes in laws and regulations, and reallocation of responsibilities between ministries and/or government levels. Decision-makers should also ensure exemplary conduct by public administrators.

Avoid

To minimize the need for individual motorized travel through adequate land-use and transport planning and management.

Individual motorized travel (by private vehicles and motorcycles) is particularly costly in terms of its implications for infrastructure development, road maintenance and traffic management. Private motor vehicles also bring with them noise and environmental pollution, public space obstruction, social equity problems, and road accidents.

The need to counter these negative impacts and minimize motorized travel is seldom well addressed. On the contrary, current urban development processes too often separate residential, services, and industrial areas in a way that multiplies the need for individual motorized travel. Also, a number of urban development projects (including "new towns") are implemented without considering either public transport availability or pedestrian pathways.

In essence, the "Avoid" element of the EASI framework focuses on designing and implementing improvements in accessibility and multimodal integration at the urban planning level (land use, infrastructure, and transport services). The purpose is to ensure safe, permanent, equitable and efficient accessibility of the citizens to the services and opportunities that they want and require, while minimizing costs and negative externalities resulting from urban transport - mainly from motorized transport.

To meet these objectives, three main policy recommendations are outlined below, first at the strategic planning stage for integrating land and transport planning, then at the tactical stage of deployment of transport infrastructure, and, finally, at the land use management stage.

Table 8. Policy recommendations materializing "Avoid"

A1	To plan for urban forms and land use that minimize the need for individual motorized travel and promote public transport and non-motorized transport modes.
A2	To deploy transport infrastructure and services in a manner that promotes sound urban forms and land use.
A3	To strengthen land use management.

Recommendation A1 – To plan for urban forms and land use that minimize the need for individual motorized travel and promote public transport and non-motorized transport modes

For several decades, African cities have grown very fast with insufficient capability or even time to enforce urban master plans whenever those existed. One major consequence is that their urban form is often not efficient from a transport point of view and as a result from an economic point of view. Distances between residential areas and many key activities or opportunities, often concentrated in the old historic center or away from the main corridors, are unnecessarily long. There is also not enough public space available for organizing traffic efficiently and for ensuring that public transport and walking/cycling are attractive options for citizens. Yet, international experience, most prominently in Curitiba (Brazil) or Singapore, has shown that it is possible to steer urban development and land use towards forms that are much more efficient.

Indeed, some urban configurations lend themselves to shorter-distance travel than others, which in turn is beneficial to bicycle use and walking thus reducing the dependence on motorized transport modes.

The best *urban forms well integrated with efficient and environmentally friendly urban transport solutions have the following features:*

- *relatively compact and dense forms,* seeking to control urban sprawl and the consequent long distances that come with it, thus reducing pressure on the need to use motorized modes;
- *mixed land use* (residential, employment, services, commercial and small scale industrial activities), in order to favor short distance travel based on bicycle use and walking;
- *urban forms that minimize the capital and operating costs* of transport infrastructure and services;
- *Polycentric forms* structured by and around different nodes strategically distributed on the urban territory, which limit the concentration of travel towards the central business district and, instead, ensure each local community's relative proximity to secondary urban nodes, at the scale of a "living space" within which most activities can be carried out at relatively short distances from each other. To help bring about these polycentric forms, some urban services should be relocated to the urban nodes; and

- *"Transit Oriented Design"* that leads to urban forms structured in line with available transport services. This approach favors substantial density around public transport nodes of those activities that generate trips (residential, commercial, employment and service areas). Following the same logic, activities dependent on inter-urban motorized connectivity (e.g. heavy industries or import/export warehouses) should be located near major infrastructure and nodes, if possible in the outskirts of urban areas (primary road network, railway cargo terminals, harbors and airports).

In order to mitigate congestion, alternative locations should be envisaged and carefully analyzed for activities and services responsible for generating high trip volumes, this even before looking for solutions to increase accessibility to already congested areas.

Many African urban areas are characterized by the existence of large central markets in their central business districts (Sandaga market in Dakar; Rood Woko market in Ouagadougou, Idumota and Balogun markets in Lagos, City market in Nairobi, etc.). A large part of the urban economy is structured around these nodes and many transport routes converge, carrying both passengers and merchandise. This type of concentration has its advantages, but it also comes with substantial risks and inconveniences in relation to, for instance, safety and congestion. Large parts of the urban population and economic activity are impacted by these problems. Moving part of these markets, especially their wholesaling activities to carefully selected areas outside the city center should be considered.

When formulating plans and interventions that will improve the urban form, it is essential that risks such as floods and landslides be taken into account. Integrated land use and urban transport system planning can limit certain risks at a low cost, thus improving territorial resilience. Below are examples of how to improve urban resilience to different risks, most notably risks linked to environmental issues and climate change:

- a compact urban area, with adequate public transport supply, and marginally dependent on motorized individual travel (private vehicles and motorcycles), is likely to better withstand any future reduction in fuel resources availability;
- any transport infrastructure that needs to be built near a coast, a river, a lagoon, or a flood zone, should be conceived either for the excess water to be discharged or stored, or to withstand or contain the rising sea water level (for instance in Algiers, Nouakchott or Abidjan). In addition, vulnerability studies

should be carried out on existing infrastructure and, if necessary, those should be retrofitted; and

- tree planting next to urban roads can have a positive impact on heat reduction (urban "heat island" effect) and absorption of carbon emissions while, at the same time, improving walking conditions (shadow, green space).

Recommendation A2 – To deploy transport infrastructure and services in a manner that promotes sound urban forms and land use

As experience has repeatedly shown, the implementation of road infrastructure or mass transit projects is one of the most efficient tools for public authorities to gain control of urban development. Indeed, transport infrastructure and services should not be perceived as a consequence of urbanization processes, but as a precondition to urbanization. Authorities should use infrastructure projects to steer progressive urbanization according to preferred urban forms and, right from the beginning, encourage user behavior in favor of preferred mobility choices.

More specifically, they should:

- deploy transport infrastructure, beginning with road infrastructure, in order to guide progressive urbanization. A gradual approach is required, beginning with land reserves, through phase-by-phase construction, each phase encouraging development around the axis defined by the road infrastructure and in coordination with the deployment of different urban services and utilities, especially water and electricity;
- benefit as much as possible from the increasing land values that result from infrastructure deployment and the high demand for well serviced land by investors and new urban dwellers. Capture of land value gains is an opportunity for additional fiscal revenues and for funding new projects. Adequate arrangements and tools should be put in place for this purpose; and
- develop, as early as possible, sufficient bus transport coverage in the new corridors, as well as adequate conditions for walking and cycling, in new urban areas. The objective is to favor early utilisation of the less expensive and less externality-producing transport modes that are also the most accessible modes for vulnerable users. In certain circumstances, mainly large scale integrated projects, the deployment of a high-performance mass public transport line could be used to promote urbanization along a specific corridor.

Recommendation A3 – To strengthen land use management

Being the logical continuation to any urban planning process, land use management is an essential component of urban development. In urban Africa, it should include better evaluation of new projects' impact on transport efficiency and strengthening of compliance with zoning plans and construction codes.

The following measures should be taken:

- Urban land extensions or changes in land use proposed by private or public investors should be carefully assessed and their negative impacts on transport systems, often through increased congestion, should be mitigated, through adjustments in either transport capacity or the projects themselves. Securing funding for these adjustments should be the responsibility of the investors more than the local authorities. For each large project, public authorities should require the investors to conduct an accessibility study in order to estimate induced travel needs and identify sound ways to mitigate the effects of the project on existing transport services and infrastructures. The study should be conducted as part of a dialogue between urban developers and decision-makers, and should include consultations with the concerned population. It would determine the costs borne by project developers pertaining to improvement of urban space and transport services' coverage.
- Compliance with zoning plans and construction codes should also be improved drastically. This would likely require many complementary measures such as: strengthening and motivating the administrative services involved in the processing of construction permits; setting up independent audit mechanisms; using disciplinary actions whenever necessary; establishing strict procedures and clear limits for the granting of amendments to the plans and codes; and ensuring that there is much transparency in the decision making process.

Shift

To maintain or increase the modal shares of public transport and non-motorized transport modes such as walking and cycling.

A vast majority of African urban areas are characterized by heavy congestion despite low motorization rates, inadequate quality of pedestrian infrastructure and insufficient public transport services (including low territorial coverage). Confronted to most visible and frustrating congestion problems, decision-makers are too often tempted and led to focus on extending the road network, enlarging roads and building costly grade separated junctions. The experience of many cities in the developing as well as in the developed world has shown, however, that it is not possible for a city, even with vast resources, to build its way out of congestion and to accommodate ever growing traffic by building more and larger road infrastructure. On the contrary, the experience is that a balanced approach that fully uses the potential of public transport as well as walking and cycling in order to satisfy accessibility needs is the best possible way to address current ills.

In this context, this "Shift" section deals with the most urgent challenges faced by public authorities in African urban areas in order to increase the performance of their public transport systems and to facilitate walking and cycling within the framework of a multimodal strategy. Several initiatives such as the implementation of tramway networks in the Moroccan urban areas of Casablanca and Rabat-Salé, the roll out of a BRT corridor coupled with the recognition of paratransit importance in Cape Town, and the minibus renewal scheme of Dakar have shown in particular the potential for transformational actions concerning urban Africa's public transport systems.

Five recommendations are formulated, presented in the following table and developed hereafter.

Table 9. Policy recommendations materializing "Shift"

S1	To adopt and systematically introduce, at all levels and scales, a multimodal approach to the development and management of urban transport systems.
S2	To develop and maintain for each urban area a pedestrian network that is continuous, safe and accessible for all throughout the day; and to develop and maintain bicycle paths with similar characteristics.
S3	To provide an integrated and hierarchical public transport system that is efficient, reliable and capable of serving the needs of constantly evolving populations and the urban economy.
S4	To plan and implement mass transit systems that operate on exclusive infrastructure and can form the backbone of the urban public transport system.
S5	To enhance the level of service provided by paratransit operators by way of full integration in the public transport system, which requires restructuring, modernizing and promoting them.

Recommendation S1 – To adopt and systematically introduce, at all levels and scales, a multimodal approach to the development and management of urban transport systems.

Measures to improve the performance of public transport and non-motorized transport, as well as ensure efficient use of road space by all public and private transport modes should not be taken on an ad-hoc basis independently from each other. There are many reasons for this. First, all components of the urban transport system are linked and any action on one has direct or indirect impacts on others. For example, the creation of bus lanes to increase bus speed and reliability may reduce the (often unbalanced) allocation of road space to cars or motorcycles and affect traffic. However, by making public transport more attractive, it may also reduce demand for private transport modes and reduce congestion in the same corridor or even other corridors. Second, there usually are several alternative ways, sometimes indirect, to address any mobility problem and they all should be considered for their true benefits before one is selected. Third, as noted in the "Avoid" section above, a strong link between urban development and improvement of transport systems should be maintained since transport is such a powerful tool to direct urban growth. This requires analyses that go much beyond that of a few specific projects. Finally, as resources are almost always scarce and far below theoretical requirements, it is essential to identify and select those measures that have the highest benefit/cost ratios.

It is therefore essential to conceive key improvements in urban transport systems within the scope of an integrated multimodal strategy which will define an optimal set of actions to best address current and future issues in accessibility and mobility. Preparing and adopting such a strategy is a priority for all African urban areas, large or even small.

Many urban areas have already elaborated such a strategy, or "master plan", in Africa but there are few cases only where the strategy is proving realistic, truly multimodal, and useful. Often, the master plan mainly has an advocacy role. It is focused on large investments, without sufficient consideration of operational improvements and multimodal alternatives, and may even be a way to justify ex- post projects that have been decided beforehand without the benefit of a global analysis. This shortcoming, common to cities in the developing as well as the developed world, should be avoided.

The key features of a sound integrated multimodal urban transport strategy should be the following:

- An in-depth understanding of demand for mobility, condition and performance of transport systems, and accessibility issues, grounded on a wide set of data and thorough quantitative analysis;
- The elaboration and comparative analysis of key contrasted development scenarios for the urban transport systems in the context of the broader development of the urban area;
- An analysis of all financial issues, including especially realistically available resources for investment and operations, affordability, public transport tariff policies, and potential for charging car users, particularly for parking;
- The selection of the most beneficial scenario and, on this basis, the elaboration of key principles of development for each transport mode; these principles should not be limited to infrastructure or equipment investment proposals, but also include operational improvements, rules on the ways by which the public space should be shared between transport modes, financial policies, and proposals for operational integration between transport modes, particularly through the location and definition of intermodal facilities;
- The definition of the primary public transport and road networks;
- A long term investment plan in line with available resources with a clear indication of priorities; and
- A four-year or five-year priority action plan on which energies and resources should be focused in the medium term.

Experience has shown that the preparation of an integrated multimodal strategy, when it involves all stakeholders and uses well-conceived participatory processes, can help bring about a strong consensus, across stakeholders and interest groups, on what should be the common priorities for action. Such a consensus makes future implementation of all components of the strategy easier and faster. Preparation of a multimodal strategy has also often had as an essential benefit the creation of a broad data base and an in-depth understanding, valid for many years, of the issues affecting urban transport systems.

Such a multimodal approach should not be limited to the elaboration of city-wide and long term plans and strategies; it should also guide policy- and decision-makers when prioritizing investments, conceiving small-scale projects and defining operating and maintenance principles for specific components of the transport system.

Recommendation S2 – To develop and maintain for each urban area a pedestrian network that is continuous, safe and accessible for all throughout the day; and to develop and maintain bicycle paths with similar characteristics.

Walking is the transport mode most used in urban Africa but it is often neglected in public authorities' priorities. Yet, walking is particularly adapted to short-distance trips and it complements motorized travel. Even individual motorized vehicle drivers ultimately park and walk to reach their final destination.

Pedestrian network development, taking into account continuity, safety, ease of access and all day long accessibility, should be included in road design and road space allocation measures for any urban road infrastructure. Pedestrian integration should therefore be a systematic concern for authorities, not only when designing and constructing public transport interchanges, markets and access to highly frequented amenities, but also in any type of initiative pertaining to public space, including large road infrastructure programs.

Developing walking as an important transport mode and adding as soon as possible facilities that also take account the specific requirements of users with disabilities and reduced mobility require the following actions:

- develop wide, well drained, and well lit sidewalks that are usable all day long (through rainy periods, at night, etc.) and that are continuous and well integrated into any new or existing road-based urban infrastructure;
- carefully design and implement pedestrian infrastructure according to needs and demands resulting from highly frequented facilities (intermodal transfer stations, markets, intercity bus stations, etc.);
- take into account pedestrians when planning and operating crossings, intersections, and parking areas;
- look after pedestrian accessibility of the urban fabric in new public or private urban development projects (ensuring direct links between buildings and with transport interfaces, public green spaces, etc.), and monitor pedestrian paths and sidewalks to ensure that design principles are upheld (grids, widths, public lighting, urban design, etc.); and
- ensure with the help of the urban police an adequate level of service throughout time by keeping public spaces clean, safe, free from degradation, and clear of obstacles such as parked cars and street vendors, etc.

Bicycle use is currently limited to certain cities such as Ouagadougou and Marrakech. Without strong encouragement of bicycle use by authorities, this mode is likely to lose users to emerging options such as motorized two-wheelers. Encouraging bicycle use requires improving the quality of pavements, safety for users along and across road infrastructure and, whenever possible, bicycle-exclusive paths.

Recommendation S3 – To provide an integrated and hierarchical public transport system that is efficient, reliable and capable of serving the needs of constantly evolving populations and the urban economy.

The key development principles for public transport in the integrated multimodal strategy need then to be deepened to be operationalized. In most urban areas, this means restructuring the public transport network, adopting appropriate arrangements for operating and supervising services, and setting up mechanisms that provide for financial sustainability.

Because public transport services have usually developed in an organic manner and often include a myriad of (sometimes incoherent) routes based on point-to-point travel, it is a major challenge for most urban areas of Africa to transform their current public transport network into an optimized one based on service network logic. In-depth studies need to be done to achieve this transformation. The restructured network should be based on the primary network defined in the multimodal strategy. To the extent possible, it should also ensure complementarity between each public transport mode (mass transit, large buses, medium size or small buses, collective taxis, individual taxis, even moto-taxis). It should also be established in coordination with the traffic and parking management plans. This is obvious for mass transit services but it is also for most types of bus services. Indeed, given that vehicle speed and reliability of travel time are essential both for the users and the operators, buses should not suffer from street congestion. Whenever justified, dedicated lanes or rights of way and priorities at the intersections should be provided to them. This has serious consequences for traffic and parking, which should be taken into account; see specific recommendations in the "Improve" section below.

Appropriate arrangements for operating and supervising public transport services should also be adopted. Although these will depend very much on the history of public transport and the specificity of each country and city, it is recommended that maximum use be made of the private sector through various forms of public-private partnerships in the context of a sound regulatory framework. This, as well as the key factors of success, is noted in E7 above. In addition, there should be a capable entity

to play the public partner role, especially to adjust routes and performance requirements as demand changes, monitor and control operators with reference to their contractual obligations, and propose improvements to the arrangements whenever feasible. As noted in E3, it is recommended that the proposed urban transport planning and coordination body fulfil this role.

Finally, mechanisms should be established to ensure that the public transport system is financially sustainable. Given the severe fiscal constraints and budget uncertainties faced by central and local governments alike, and the dramatic impact that unpaid subsidies can have on private operators, it is preferable not to envisage any State financial contribution to public transport operations. Unless there are clear social benefits in doing otherwise, tariffs should therefore be at a level where an efficient operator can recover its costs, renew its vehicles, and make a reasonable profit. If ever subsidies are deemed necessary for socio-political reasons, strong procedures should be set up to ensure that the subsidies are fairly allocated and regularly paid, and that a level playing field is maintained between all operators. Infrastructure investments, on the contrary, particularly those necessary for mass transit and dedicated rights of way, are not recurrent expenses nor generally submitted to budget uncertainties, and have a strong justification for reducing externalities such as congestion or pollution. It would therefore be sensible that they be paid by the State and not by public transport users.

Recommendation S4 – To plan and implement mass transit systems that operate on exclusive infrastructure and can form the backbone of the urban public transport system.

As illustrated by recent relatively successful mass transit systems in several large African urban areas (Cairo, Tunis, Lagos, Gauteng Region, Cape Town, Casablanca, Rabat-Salé) it is clear that high capacity public transport services operating on exclusive infrastructure have created new dynamics in the public transport domain.

In urban areas where travel demand is steadily growing and traditional bus services struggle to keep up with that demand and have repeatedly shown their difficulty to improve service in terms of quality and quantity, mass transit projects have the potential to be catalysts for significant improvements of the entire urban transport system. Roughly all African urban areas with over half a million to a million inhabitants should consider the opportunity to integrate mass transit solutions in their multimodal urban transport strategies.

The selection of a mass transit mode between suburban rail, underground or aerial metro, tramway, or various forms of bus rapid transit (BRT) – be it "full specifications" as in Bogota or "light" as in Lagos – should consider several criteria: current and projected demand per direction during peak periods, urban integration and multimodal organization around and along the corridor, links with other public transport modes or routes, and, most importantly, the investment and operating costs, the benefit/cost ratio, and the financial resources that are available. The decision should be based on a careful quantitative analysis of alternatives, not image nor pressure from potential donors and suppliers. The feedback from most countries in the world is that the population is not attached to a particular technology but generally wants an adequate level of service for the lowest possible tariff.

The selection of routes for mass transit should be done as part of the elaboration of the multimodal strategy (as noted in S1) and the further studies to design an integrated and hierarchical public transport system for the urban area (as noted in S3).

Mass transit projects are costly but can have high benefits because of their high performance, potential to lower traffic congestion, and reduced gas emissions. If conceived in a global urban development frame, such investments can also be the basis for major urban renewal projects. During the 1980s, Tunis used the construction of a light-metro system to give priority to pedestrians and restrain other motorized modes in the city's central area. In Casablanca, more recently, the Place des Nations was returned to pedestrian activities. These two examples illustrate the type of opportunities that come with such major infrastructure investments.

In addition, as illustrated by the recent contracts in Cape Town pertaining to BRT operations, mass transit projects can be used to redefine stakeholder roles (including that of the existing paratransit operators) and to negotiate their participation in the global public transport system.

Recommendation S5 – To enhance the level of service provided by paratransit operators by way of full integration in the public transport system, which requires restructuring, modernizing and promoting them.

Informal or semi-formal paratransit operators dominate the public transport scene in urban Africa as in many parts of the world. They often have an enormous transport capacity and generate a massive amount of jobs through their operations as well as through bus maintenance and all sorts of related businesses. They have generally

proven to be an economic and political force that can be organized and promoted to better contribute to meeting the accessibility needs of the population.

The minibus fleet renewal scheme in Dakar (Senegal), initiated by CETUD since around 2005, is an example of program that has comprehensively restructured the sector. It has included the introduction of regulations pertaining to minibus service supply inside the urban area, the restructuring of a large number of minibus operators into formal business groups and major improvements in the bus network design. This program, which has involved complex decisions and disciplined management by CETUD, has been very successful so far.

African urban areas should emulate the example of Dakar and restructure and modernize their paratransit sector. The main steps for doing this are the following:

- Group small operators into enterprises or cooperatives of about 50 to 100 vehicles since it would not be possible to regulate and guide thousands of individual operators;
- Award franchise contracts to these enterprises for specific areas or routes (defined as part of the entire network restructuring exercise mentioned in S3) with clear performance requirements (concerning vehicles, service quantity and quality, driver behavior, etc.); the contracts should be fair and balanced, stipulate rights and obligations of the operators as well as the State, and be appropriate for small entrepreneurs;
- Establish simple and fair mechanisms for tariff setting based on cost recovery principles (as noted in S3);
- Put in place supervision procedures and organize the urban transport planning and coordination agency so that it is able to manage and control the operators;
- Provide managerial, technical, legal, and financial support to the operators and create a special unit, within the agency or separately, to deliver that support; and
- Put in place a financing mechanism to help modernize paratransit vehicle fleets and at the same time provide an incentive for operators to participate in the entire restructuring scheme; the mechanism should not involve subsidies as experience has shown that the key constraint is availability of funds and not the level of interest rates and that subsidy schemes are rarely fairly administered.

Box 22. Reforming and integrating paratransit services - the "EASI way"

With few and notable exceptions, paratransit services are an important – if not the main – component of public transport systems in urban Africa. Usually first developed as fully informal modes, paratransit services evolve and prosper in the context of weak, unenforced or non-existing regulatory frameworks. Indeed, paratransit services often appear as a privately developed response to a transport demand unattended by formal public transport operators, when they exist.

At present, paratransit services take many forms (informal or relatively formal, fully unregulated or marginally regulated, etc.) and they represent a valid and viable answer to urban mobility needs. A wide range of vehicles, from motorcycle taxis to mini- and midi-buses characterize the sector; yet, in most cases, minibuses are seen as the archetypical mode. Relying on adaptability, flexibility, important territorial coverage and demand-responsiveness, paratransit services have established their role in African cities providing general urban accessibility and linking peripheral areas with employment opportunities. Furthermore, paratransit services do not rely on public subsidies and they remain affordable to large percentages of urban populations. Also, paratransit services represent an employment opportunity for a significant number of mostly poor households: besides drivers and fare collectors, the sector employs mechanics, cleaners and similar subsidiary profiles. In all, the paratransit sector has a non-marginal economic weight in most urban areas of Africa.

Nevertheless, the sector is also responsible for negative externalities that affect urban Africa. Through disjointed and disorganized route networks, paratransit fleets of old – sometimes not roadworthy – paratransit vehicles typically converge to central areas exacerbating congestion, road safety problems, air and noise pollution and green-house gas emissions. Such externalities and a highly negative image of paratransit have fuelled transformation initiatives that have been, more often than not, unable to achieve their stated objectives. With few exceptions, attempts to improve and reform urban public transport systems through the full substitution of incumbent paratransit operators with new formal services have not been successful. In the absence of viable and credible alternatives, urban populations still resort to familiar paratransit services and their specific advantages.

Considering the paratransit's negative externalities and the need for mass transit supply in larger cities, the proposed approach is to develop urban transport systems that integrate paratransit while at the same time aiming at reducing its role over time. To achieve this, a new approach to public transport reform is necessary, one that does not conceive paratransit as a mode to be eradicated.

Successful initiatives recognize the comparative advantages of paratransit to respond to certain accessibility and mobility needs, and search to combine formal and paratransit modes where each is best suited, in a complementary and evolutionary manner, seeking to continuously adapt and improve service levels. The EASI conceptual framework and its four dimensions should help to operate this paradigm shift when attempting to reform and integrate paratransit services in urban Africa.

Considering first the **Enable** dimension and its corresponding policy recommendations, a national urban transport strategy (E1) should specify the role of para-transit services and its expected evolution,

and assign clear institutional responsibilities (E2), favoring the setup, at local level, of an entity in charge of urban mobility planning and public transport regulation, incl. paratransit (E3). Human and financial resources must be in line with assigned responsibilities (E4 & E5), a pre-condition for all stakeholders involved, incl. those from the public sector, whose involvement should be enhanced (E7).

In Dakar/Senegal, the setup of CETUD (Dakar Executive Urban Transport Council) and the remarkable bus renewal scheme (first program in Sub-Saharan Africa to implement bus renewal using public sector finance to benefit private sector operators while leveraging this financing to formalize and professionalize bus operations) are two parallel components of a national urban transport strategy that has been pursued since the 1990s.

Furthermore, objectives of the **Avoid** dimension should be taken into account when designing programs seeking paratransit reform. Planning for urban forms that favor public transport and non-motorized options requires, from the onset, to give paratransit services a controlled and clear role in the system. As well, significant opportunities are to be found in any attempt to coordinate paratransit reform and transit-oriented development (TOD) schemes, for instance in the design of multimodal interfaces. Indeed, while the Enable element of the EASI policy is urgent to set the foundation of a sustainable paratransit program, the Avoid element will be key when identifying long-term objectives of the said program.

Underlying the policy recommendations pertaining to the **Shift** dimension, particularly for Africa, is a higher order objective of increasing the share of trips that are made in high capacity vehicles (thereby reducing the total number of vehicle kilometers for a given number of trips served). This involves successfully reforming and integrating paratransit, through the systematic adoption of a multimodal approach (S1), the provision of integrated and hierarchical public transport systems (S3), the planning and implementing of mass transit systems to provide efficient mobility alternatives to paratransit services (S4), and the enhancement of paratransit services themselves (S5).Last but not least, the **Improve** dimension and its corresponding policy recommendations are also of importance for successful and sustainable paratransit reform. Better urban roads and traffic management schemes (I1) are usually key to improve and sustain performance of public transport services, e.g. through dedicated lanes and/or traffic signal priority. Technical requirements for vehicles and fuel (I2) as well as their enforcement (I3) are also important parameters to be considered in any attempt to enhance and reform paratransit services.

The relevance of the EASI conceptual framework for paratransit can be illustrated taking the example of the Cape Town's recent BRT implementation program, an ambitious project that has successfully incorporated infrastructure development and paratransit reform (some incumbent operators, after several rounds of negotiation, created new operating companies and are now operators of the MyCiTi system). Though this project, authorities in charge of Cape Town's public transport system – incl. heavy rail, BRT, conventional bus and minibus services – have taken a major step towards integration of all transport modes.

Improve

To improve the efficiency and safety of transport modes while minimizing their environmental footprint.

Many urban areas suffer from mild to severe congestion, as it is the case in Abidjan, Casablanca, Kinshasa or Lagos. If congestion is generally understood as the result of too many vehicles using under-dimensioned road infrastructure, studies show that congestion in urban Africa also, and often mostly, results from poor traffic and parking management.

Inadequate public space provision and poor traffic management are also a significant cause of low speed and poor time-reliability of public transport services, and of high accident rates. As a consequence, most users who become able to access individual motorized transport modes tend to favor these over public transport use and non-motorized mobility; a trend that precisely acts towards increasing congestion and traffic related air and noise pollution.

Thus, improving traffic and parking management reveals a strong potential to enhance accessibility and to promote sustainable mobility in urban Africa.

In addition, improvements pertaining to vehicle technologies and driving behaviors are to be considered in order to restrain fuel consumption and cut-down pollution and greenhouse gas emissions resulting from road transport. Positive outcomes should result from such efforts, in terms of public health, environmental quality and economic conditions.

Consequently, three recommendations are put forward below:

Table 10. Policy recommendations materializing "Improve"

I1	To improve planning, operation and maintenance of urban roads taking into account and balancing the needs of all transport modes and keeping the use of individual motorized vehicles under check.
I2	To define and implement realistic and gradually more demanding requirements in terms of fuel components, energy efficiency and gas emissions.
I3	To promote safe and environmentally responsible behavior by all urban transport stakeholders, by strengthening technical control of vehicles and by keeping the public informed of the negative externalities of individual motorized transport.

Recommendation I1 – To improve planning, operation and maintenance of urban roads taking into account and balancing the needs of all transport modes, and keeping the use of individual motorized vehicles under check.

Public space is an essential support for all road based transport modes, incl. walk-ing and bicycling. Thus, its layout and functioning should align with the city-specific multimodal strategy (cf. S1) and balance the needs of all transport modes according to an optimal combination of social, economic and environmental priorities.

The key here is to drastically improve urban road provision in urban Africa through appropriate design standards – both at network and street levels – and adequate maintenance, as well as to make proper use of traffic and parking management tools.

Balancing the needs of the diverse and numerous public space users requires strong regulation, otherwise cars win over pedestrians, buses are caught in traffic, sidewalks (where they exist) are invaded by vehicles and commercial activities, and congestion spreads without control.

Instead, appropriate design standards and traffic management tools allow to:

- Improve accessibility, road safety and urban quality by better channeling major traffic flows away from sensitive residential and commercial areas, by keeping speeds under check and by enhancing public space (e.g. safe and comfortable conditions for pedestrians, green space);
- Encourage most environment-friendly and socially equitable transport modes, typically public transport (dedicated lanes, adequately laid out stations, priority given at signalized intersections, etc.) and walking (wide and well lit sidewalks, secured crosswalks, continuous paths, etc.), while restraining motorized individual vehicle use to minimal accessibility requirements; and
- Ensure optimal use of scarce financial means available to build and maintain road infrastructure; etc.

To achieve this, public authorities in urban Africa need to have specific expertise about, and effective command of, a number of complementary tools:

- City-wide strategic traffic management tools to support: functional road hierarchy (specific functions and corresponding dimensions attributed to the various road/street categories), traffic flow regulation strategy (preferred itineraries and traffic flow guiding principles), global parking supply policy (number of on-

street and off-street car parks, specific rules and tariffs to be applied in various parts of the city), freight transport and delivery schemes, public location guidance system, traffic management control center, road maintenance strategic plans, etc.;

- Street and intersection design standards and operational guidelines, incl. state-of-the-art and tailored-made conception principles and min/max dimensions for urban space layout (mixed- or dedicated-use lanes, sidewalks, delivery and parking space, green space. etc.), intersection design (when and how to design a right-of-way crossing, a round-about, a signalized intersection or a grade-separated intersection), traffic signaling design (functional programming, detection and user actuation, energy supply, etc.), directional signage, etc.;
- National road traffic code, city-specific road use rules and corresponding enforcement means;
- Road and traffic signal maintenance programs and corresponding resources; and
- Fiscal instruments susceptible to help contain the potential increase of individual motorized vehicle use within reasonable levels, through a coherent set of taxes (vehicle acquisition tax, fuel tax, parking fees, road pricing, etc.).

Recommendation I2 – To define and implement realistic and gradually more demanding requirements in terms of fuel components, energy efficiency and gas emissions.

Faced with the strongly negative impacts of growing motorized traffic on the environmental quality of their urban areas, African governments should take action towards enhanced fuel quality and vehicle technology.

Concerning fuel quality, current and past efforts are to be sustained. The dangerous effects on public health of fuels containing lead (gasoline) have been largely recognized and led to critical decisions favoring unleaded fuels. The same cannot yet be said for similarly dangerous diesel fuels containing sulphur. Here, despite of significant progress evidenced in the past ten years, strong efforts are still needed in most African countries, particularly in Egypt, Congo and Mali (source: UNEP 2013).

It is important to note that without clean fuels (particularly fuels with low sulphur content), attempts to renew vehicle fleets - towards higher energy efficiency and lower polluting emissions - cannot succeed.

Precisely, decision-makers should define and enforce gradually more demanding vehicle-related norms seeking a progressive fleet renewal.

Vehicle fleet renewal is an important reform component that reaches beyond strict environmental issues, touching on complex economic and social issues. Hence, it is important to consider fleet renewal as a global concern, while keeping in mind Africa's specific context (e.g. scarce financial capacity of households, low motorization rates, predominance of second-hand vehicles, more or less formal repair services).

As a general rule, it appears necessary to keep a pragmatic balance between the need to ensure accessibility throughout both urban and rural areas, particularly for most vulnerable people, the political ambition to set high environmental standards and the need to preserve job-creating activities in African urban areas. Thus, defining energy efficiency and carbon or greenhouse gas emission norms is necessary, but such norms should result from a long-term perspective and their implementation should follow a realistic and pragmatic roadmap:

- Identification of realistic steps with respect to roll out of norms, allowing for effective implementation (as an illustrative example, it is best to impose a EURO 3 norm to vehicle imports rather than a EURO 6 norm whose implementation would not be possible considering currently available fuels); and
- Acknowledgment of scientific progress made that helps identify risks on public health and their specific causes. Technological answers to fuels and vehicles are also continuously evolving. Hence, the purpose here is to ensure periodic updates of adopted norms, in cooperation with neighbor countries, international organizations and private stakeholders.

Recommendation I3 – To promote safe and environmentally responsible behavior by all urban transport stakeholders, by strengthening technical control of vehicles and by keeping the public informed of the negative externalities of individual motorized transport.

Vehicle owners and vehicle users have a role to play in the protection of the environment, being individually responsible for their modal choice, for the choice of their vehicle and for their driving behavior. Here too, public authorities have a responsibility to foster an adequate evolution of users' behaviors.

Two key levers for improvement are highlighted below:

- To strengthen technical control of vehicles: throughout Africa, it appears to be a necessity to introduce or to strengthen technical control and monitoring of roadworthiness for all motorized vehicles, private and public, with respect to safety and environmental impacts, globally (carbon emissions) and locally (polluting emissions). To succeed, the main requirements are to define more demanding technical criteria, to deploy regional facilities allowing for the control operations, and to increase the number of capable human resources.
- To keep the public informed of the negative externalities of individual motorized traffic: providing information about the direct impacts of motorized traffic (e.g. air and noise pollution, accidents, degraded public space, climate change) is one component of a larger public communication strategy aiming to increase awareness about the challenges and opportunities related to sustainable urban mobility. Such a communication strategy seeks of course to promote transport modes with limited environmental footprint, as well as eco-friendly driving behaviors.

Three main categories of stakeholders are concerned by this last mentioned lever for improvement:

- City dwellers should be encouraged to choose public transport or non-motorized transport modes when a modal choice exists; they should also opt for safe and most environment-friendly models when purchasing a motorized vehicle; finally, when driving, they should opt for eco-friendly behaviors (with a direct interest to reduce fuel consumption) and for maximal safety (with a direct interest to avoid accidents).
- Public transport and freight transport operators (vehicle owners and drivers alike) should be encouraged to adopt eco-friendly driving behaviors, since these help reduce fuel consumption and expenditure, improve comfort for passengers, preserve goods' quality, and reduce air and noise pollution.
- Investors and employers should be enticed to favor locations allowing for easy and eco-responsible accessibility for employees, customers and goods; they should also be encouraged to implement specific corporate measures promoting eco-friendly modal choices as well as low consumption and low-emitting vehicles. By opting for such sustainable policies, investors and employers should be able to perceive direct economic interests, e.g. reduced

parking needs and related expenditure, increased productivity resulting from enhanced well-being of employees and better compliance with working hours.

Where to start

All policy recommendations developed in this paper are geared to policy- and decision-makers in charge of transport and urban development, anywhere in Africa.

Each urban area is a particular case, with its specific territorial and socioeconomic reality, its specific transport system and subsystems, its institutional and regulatory framework, and with the particular transformations it is facing – in a more or less controlled manner (cf. city typology in Box 2).

As a consequence, the order and the degree of priority with which these recommendations must be applied depend – partially at least – on the situation and the dynamics that are specific to each country or even to each urban area.

These recommendations constitute a set of levers to be activated simultaneously, in the most coherent and coordinated way as possible. It would be inappropriate and inefficient to select only a few recommendations and leave the others aside.

To develop and manage sustainable urban mobility is a complex and necessary endeavor that relies on the collaboration and cooperation of a number of - public and private - stakeholders, at different levels and from several sectors. Success cannot be achieved by one person or by one institution in a short period of time; rather, a strong dedication from many is needed over a significant period in order to meet the challenge.

Sustainable urban mobility is the result of an efficient and continuous process, fueled by a strong will to succeed beyond purely partisan considerations and the limited timeframe of political mandates. It does not result from a project or a program, not even from a series of projects. .

This overarching requirement underlies namely the first policy recommendation to define, adopt and implement, at central government level, a national urban transport strategy (E1). Indeed, the setting up of such a strategy cannot be limited to the production of a motionless document gathering the best intentions of the moment. Be-

yond the strategy document that needs to be produced, in order to clarify and spread ideas and decisions, it is rather essential to set up a common framework and clear working processes – at technical and political levels – enabling to mobilize all stakeholders, share experience, identify priority needs, define adequate measures and monitor progress.

The elaboration and implementation of a national strategy towards sustainable urban mobility is also an opportunity to identify the main stakeholders and to get them involved, de facto creating the core of a community of practice that should gain strength and structure over time.

The good practice is that the initiative and the piloting of such an initiative belongs to the Ministry in charge of urban transport (e.g. Ministry of transport, albeit it can be another Ministry – as in Morocco, where urban transport is under the responsibility of the Ministry of Interior). In any event, it is important to associate all the institutions concerned, both at the national level (urban planning, environment, economy, etc.) and at the local level (local governments in charge of urban areas), also involving representatives from the private sector, civil society and observers/analysts from academia.

In recent years, Tunisia and Morocco took such initiatives through the organization of "National Urban Transport Days", a two-day workshop which allowed to bring together the main stakeholders, to assess the current situation and to define a road map for the next steps. In Morocco, the Ministry of Interior has been regularly organizing a series of events in recent years. These allowed to put urban mobility on the political agenda, to support the elaboration and the implementation of necessary reforms, and to build momentum towards a sustained development process.

Nonetheless, it is possible and even necessary to implement the policy recommendations also at a local level, without waiting for a national strategy. The importance and the urgency of the challenges at hand do not allow to wait for framework conditions to be perfect; such conditions may not/never appear since the key issues are likely to become more complex and the problems more acute if nothing is undertaken rapidly.

The EASI conceptual framework and the policy recommendations developed in this paper allow to take action immediately. Indeed, any decision to be taken for any project, program or policy having a direct or indirect impact on the demand- or supply-side of urban transport can be assessed without delay through the filter of EASI. To illustrate this, if a decision-maker has to approve a road investment, he or she ought

to verify (i) if the project complies with strategic plans or goals, and if it may cause to increase land value in such a way as to favor urban sprawl [Avoid], (ii) if the project does envisage or allow to favor public transport and to provide safe conditions for the most vulnerable users [Shift], (iii) if foreseen traffic management and maintenance schemes allow to ensure appropriate level of services [Improve], and (iv) if the main stakeholders were adequately involved in the elaboration of the project and if the average human and financial resources are sufficient to achieve the objectives pursued [Enable].

As shown in this example and by extension, it is possible to apply the EASI concept immediately, for any decision impacting urban mobility conditions and at all scales. And it is necessary to do so right now, in a very tangible way.

Decision-makers have to face the question about whether it is best to start by ensuring appropriate enabling conditions, typically by setting up an institution specifically in charge of urban transport before initiating investments towards sustainable urban transport systems? Or if it is better, on the contrary, to initiate investments even before setting up an appropriate institutional framework to ensure proper governance of the urban transport system? To such questions, there is not one correct answer, nor one clearly wrong answer. The best option is certainly to simultaneously engage efforts on the various fronts, which will feed one another, in a continuous process of gradual improvements and learning.

In light of Africa's pressing and very rapidly increasing needs, if proper thinking is important, timely action is crucial. Action should mobilize all available resources and institutional energy towards sustainable accessibility and urban mobility, no matter what the initial standpoint is and no matter which institution takes the initiative first.

5. Conclusion

There is an urgency to act now to respond to the challenge of mobility and accessibility in urban areas in Africa. From 415 million African citizens presently living in cities, by 2050 the African urban population is projected to escalate to over 1.2 billion inhabitants (e.g. over 60% of the continent's population). Congestion is already hampering the movement of people and goods in many cities and economic zones and causes both environmental, health, and economic concerns which are challenges for transport.

Crippling congestion in urban areas is aggravated by inadequate policy frameworks and a weak capacity to address the environmental, social and safety risks of fast growing motorization. Economic growth will also result in accelerated motorization due to the current low motorization rate. Lack of coordinated planning of land-use and transport has led to inefficient cities, congestion, and unsatisfied transport demand, in particular for the poorer segment of the population (affordability and inclusiveness issues).

Based on the primary and secondary data collection and analysis undertaken in this assignment, the following main issues impacting on the state of accessibility and mobility in African urban areas have been identified, namely: governance; transport infrastructure and services; and the negative impacts and externalities of dysfunctional transport systems. The literature review part of the study confirmed that these key issues have consistently been identified in researches and publications by leading scholars as the main issues affecting the state of mobility in African urban areas.

In respect of most of these issues, useful lessons can be drawn from international experience over the past decades. These lessons are presented in chapter 3 of this report and linked to the main issues to enlighten the reader on the approaches used and the outcomes.

Drawing on the lessons from international experience this report proposes a set of policy recommendations, structured using the Enable – Avoid – Shift – Improve (EASI) conceptual framework.

Implementing these policy principles will require overcoming barriers to change: lack of sound governance; lack of political will; limited organizational capacity at national and city government level; lack of a holistic long term vision for urban development; lack of data and know-how in respect of urban mobility issues; and the predominance of short term individual interests over the longer term interests of the general public.

The key for success is to demonstrate to policy- and decision-makers the catalytic impact of improvements of the transport system, and to help them realize that these improvements are not only urgent, but also within their control. African cities are facing many challenges. Pressure from unforeseen and unplanned urban growth is great and the financial and institutional capacity of most national and city governments is not strong enough to cope with the rate of urbanization. This paper therefore concludes that African cities need support to successfully address their urban mobility challenges. However before financial support is considered, the first form of support needed is dialogue and coordination amongst policy- and decision-makers.

In priority, African cities need long term visions that speak to the nature of each city's economy, its urban form, its inhabitants' quality of life and each city's position in the African and global context over the medium to long term. Such visions should be supported by strong political will. In so doing the contribution of mobility improvements to overall city development will be better understood, and investment in mobility improvements will begin to enjoy greater priority.

A fundamental belief that underpins the policy recommendations put forward in this report is that "Everyone needs accessibility, and everyone needs mobility". Indeed all urban dwellers share a common need to reach economic opportunities and social amenities in the quickest, most affordable, most convenient and safest way possible. At the same time all urban dwellers should be afforded a high quality urban environment, starting with clean and safe public spaces.

The pursuit of the policy recommendations outlined in this paper is meant to set African cities on the path to better mobility, better accessibility and better quality of life for all.

The need for action is strong and urgent!

Annexes

Annex 1. Summary of EASI policy recommendations

ENABLE - To establish an efficient and responsible governance system, capable of anticipating needs, guiding action and ensuring integrated management and development of urban transport systems.	
E1	To define, adopt and implement, at central government level, a national urban transport strategy that ensures the sustained development and management of urban transport systems.
E2	To ensure that the main urban transport public responsibilities at urban / metropolitan level of government are assigned and carried out.
E3	To set up an entity in charge of urban transport planning and of guiding and coordinating public action aimed at the provision of the multimodal urban transport system.
E4	To provide all institutions and stakeholders in the urban transport sector with adequate human resources.
E5	To increase financial resources allocated to urban transport systems and to ensure the availability of long-term funding for urban transport.
E6	To create the preconditions for continued civil society participation in the development of urban transport systems.
E7	To enhance the involvement of the private sector in the provision of transport infrastructure and services.
AVOID - To minimize the need for individual motorized travel through adequate land-use and transport planning and management.	
A1	To plan for urban forms and land use that minimize the need for individual motorized travel and promote public transport and non-motorized transport modes.
A2	To deploy transport infrastructure and services in a manner that promotes sound urban forms and land use.
A3	To strengthen land use management.

SHIFT - To maintain or increase the modal shares of public transport and non-motorized transport modes such as walking and cycling.	
S1	To adopt and systematically introduce, at all levels and scales, a multimodal approach to the development and management of urban transport systems.
S2	To develop and maintain for each urban area a pedestrian network that is continuous, safe and accessible for all throughout the day; and to develop and maintain bicycle paths with similar characteristics.
S3	To provide an integrated and hierarchical public transport system that is efficient, reliable and capable of serving the needs of constantly evolving populations and the urban economy.
S4	To plan and implement mass transit systems that operate on exclusive infrastructure and can form the backbone of the urban public transport system.
S5	To enhance the level of service provided by paratransit operators by way of full integration in the public transport system, which requires restructuring, modernizing and promoting them.
IMPROVE - To improve the efficiency and safety of transport modes while minimizing their environmental footprint.	
I1	To improve planning, operation and maintenance of urban roads taking into account and balancing the needs of all transport modes, and keeping the use of individual motorized vehicles under check.
I2	To define and implement realistic and gradually more demanding requirements in terms of fuel components, energy efficiency and gas emissions.
I3	To promote safe and environmentally responsible behavior by all urban transport stakeholders by strengthening technical control of vehicles and by keeping the public informed of the negative externalities of individual motorized transport.

Annex 2. City typology indices development

City typology indices development

The typology indices were developed to evaluate the performance of each city's mobility system (Y-axis), as well as their institutional ability to improve that performance (X-axis). The indices were calculated using secondary data collected from resident experts in each case city, through a questionnaire developed for this purpose. This questionnaire included a mixture of qualitative and quantitative questions. To create indices based on multiple question types, quantitative and qualitative question responses needed to be standardized and weighted.

Responses to quantitative questions were converted to a value out of 100, by dividing the city's response value by a realistic maximum possible value, and multiplying by 100. Responses to qualitative questions were converted to a value between 0 and 100. For instance, a 'yes' response resulted in a value of 0, a 'no' response resulted in a value of 100, and an 'under development' response resulted in a value of 50.

Index categories: Questions and weightings

Table A. Question and weighting distribution for the X-axis governance index

Category	Weight (%)	Question		Weight (%)
Land use planning and control	20	Q8	Is there a clearly defined relationship between the transport authority/body and the metropolitan/city government?	3
		Q19	Does the city have an approved plan for its future urban development (e.g. a 'master plan', 'growth management strategy' or 'spatial development framework')?	9
		Q20	Does the city have an approved development plan (e.g. an 'integrated development plan') to which urban development plans and transport plans relate?	5
		Q40	Is the city developing at low residential densities?	2
		Q52	What is the gross urban population density? *	1
Transport supply and demand	40	Q21	Is there an approved plan for the expansion/upgrade of public transport services?	6
		Q22	Are projects to expand/upgrade public transport services currently underway?	5
		Q23	Is there an approved plan for the expansion/upgrade of public transport infrastructure?	5
		Q25	Is there an approved plan for the expansion/upgrade of walking and cycling infrastructure?	2
		Q26	Are projects to expand/upgrade walking and cycling infrastructure currently under construction?	2
		Q27	Is there an approved plan for the expansion/upgrade of road infrastructure?	5
		Q28	Are projects to expand/upgrade road infrastructure currently under construction?	5
		Q62	Does the city have scheduled/formal bus services?	5
		Q69b	Does the city have a mass transit/trunk service system?	5

Category	Weight (%)	Question		Weight (%)
Human and financial resources	40	Q4	Is there a legislative framework that governs transport planning and regulation at the national, regional and metropolitan/city level?	8
		Q5	To what extent does the legislative framework provide a clear allocation of roles and responsibilities between the different levels of government (national, regional and city governments)?	5
		Q7	Is there an established transport authority/body at the metropolitan/city level?	4
		Q9	Is there a clearly developed set of institutional arrangements for the planning and management of road and non-motorized transport infrastructure?	1
		Q10	Is there a clearly developed set of institutional arrangements for the planning and regulation of public transport services?	1
		Q11	Does the transport authority/body have power over transport planning?	2
		Q12	Does the transport authority/body have power over transport regulation?	2
		Q13	Does the transport authority/body have power over funding for public transport?	2
		Q14	Does the transport authority/body have power over the contracting of transport operators?	2
		Q15	What is the technical capacity of the officials responsible for transport planning?	4
		Q16	Is there an appropriate inter-governmental fiscal and finance framework in place to support transport system improvements?	5
		Q18	Does the city's transport planning and regulation occur within the context of a well-defined national strategy?	1
		Q30	For the most recent year for which data are available, what is the GDP per capita? *	3
	100			100

Each index was comprised of a number of categories. Questions that were deemed relevant to different categories were selected for inclusion in the index calculation. The questions, and their associated index categories and weightings, are presented in tables A and B Quantitative questions are marked with an asterisk.

Table B. Question and weighting distribution for the Y-axis performance index

Category	Weight (%)	S-category	Weight (%)	Question		Weight (%)
Mobility and transport system	60	*Public transport services*	30	Q62	Does the city have scheduled/formal bus services?	5
				Q67	Do the majority of public transport passengers utilize scheduled/formal public transport services?	5
				Q73	What proportion of unscheduled/informal public transport service vehicles are unregulated/unlicensed? *	5
				Q74a	What is the mean age of the bus vehicle fleet? *	2
				Q74b	What is the mean age of the minibus vehicle fleet? *	5
				Q78	Are public transport modes formally integrated in any way?	5
				Q93	What is the peak hour capacity utilization of public transport passenger spaces? *	5
		Infrastructure	30	Q54	Is the majority of the road network paved?	5
				Q58	Is there an approved plan for the maintenance of road, footway and cycle way infrastructure?	5
				Q59	Is road, footway and cycle way infrastructure adequately maintained?	10
				Q79	What are weekday peak hour mean operating speeds, by mode? *	8
				Q92	What is the mean peak hour traffic speed on major roads entering the CBD? *	2

Category	Weight (%)	S-category	Weight (%)	Question		Weight (%)
Externalities and impacts of the transport system	40	*Travel cost and time*	20	Q94	What is the mean morning peak period work trip travel time in the city? *	5
				Q95	What is the mean morning peak period work trip length in the city? *	5
				Q96	What proportion of gross household monthly income is spent on transport? *	8
		Safety	15	Q106	For the most recent period for which data are available, what is the annual number of road crash injuries and per 100,000 population? *	2
				Q107	For the most recent period for which data are available, what is the annual number of road crash fatalities and per 100,000 population? *	3
				Q108	For the most recent period for which data are available, what is the proportion of road crash fatalities are vulnerable road users? *	10
		Pollution	5	Q105	For the most recent year for which data are available, what are CO_2 equivalent emission levels from urban transport? *	5
	100		100			100

Data reliability

Data unreliability was a problem encountered in the data analysis phase. Each question response was compared to the responses from the other 20 case cities in order to identify potential outliers. If an outlier was identified, a further search for alternative secondary data was undertaken to determine its plausibility, and if necessary, the value was replaced. For values that were implausible and alternative secondary data could be found, in a small number of cases the response in the database was adjusted to 'no data'.

Data availability

To reflect the problem of missing data in the compiled database, questions without data contributing to in the Y-index calculation were assigned an imputed value. It was assumed that cities without data were more likely to be relatively weak performers. In

the case of quantitative questions, therefore, 50% of the mean value was subjectively assigned to such questions. In the case of qualitative questions, a subjective value of 25 out of 100 was assigned.

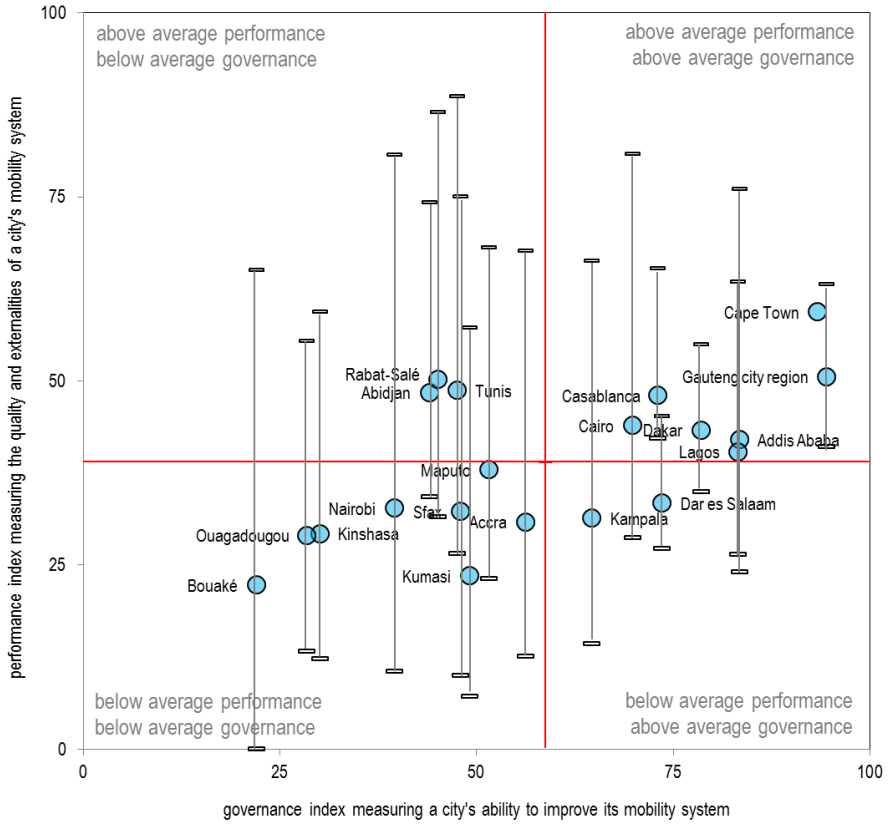
To reflect the inaccuracy of a city index value calculated using imputed data (i.e. using the method described above), a further potential minimum and maximum index value was calculated. In order to calculate minimum and maximum values, questions without data were assigned a value of 0 and 100 respectively. The vertical line connecting maximum and minimum values, and intersecting the imputed index value, therefore represents the range of possible points city plots could occupy.

An important observation from data compilation and analysis is that a correlation exists between governance capability and data availability/reliability. Where governance capability is observed to be stronger, more data was found to be available.

Main figures[4]

The main figures built on the basis of the City typology indices are presented below:

Figure C. Case city typology



[4] Notes:

- ABI=Abidjan (Ivory Coast); ACC=Accra (Ghana); ADA=Addis Ababa (Ethiopia); BOU=Bouaké (Ivory Coast); CAI=Cairo (Egypt); CAT=Cape Town (South Africa); CAS=Casablanca (Morocco); DAK=Dakar (Senegal); DES=Dar es Salaam (Tanzania); GAU=Gauteng city region (South Africa); KAM=Kampala (Uganda); KIN=Kinshasa (Democratic Republic of the Congo); KUM=Kumasi (Ghana); LAG=Lagos (Nigeria); MAP=Maputo (Mozambique); NAI=Nairobi (Kenya); OUA=Ouagadougou (Burkina Faso); RAB=Rabat-Salé (Morocco); SFA=Sfax (Tunisia); TUN=Tunis (Tunisia)
- This annex describes the method followed in constructing the city typology indices.
- National urbanization rate data in figureD4 were obtained from the CIA World Factbook (https://www.cia.gov/library/publications/the-world-factbook/fields/2212.html).

Figure C1. Governance-performance relationship

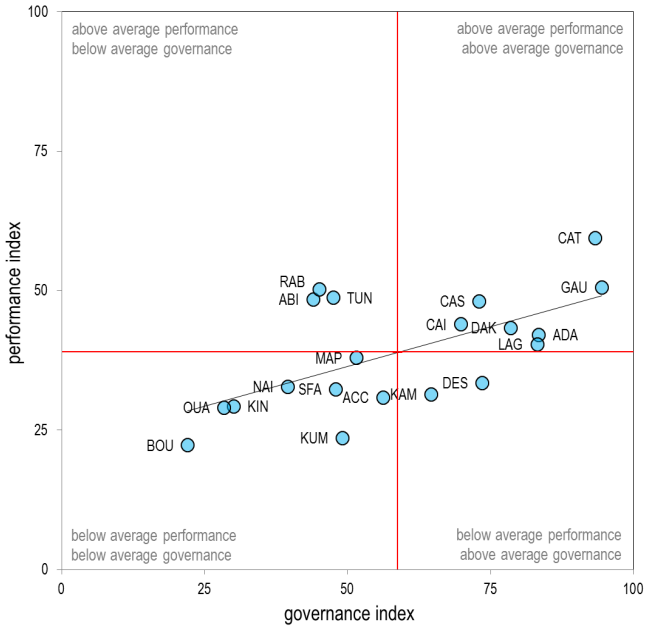


Figure C2. Governance-data reliability relationship

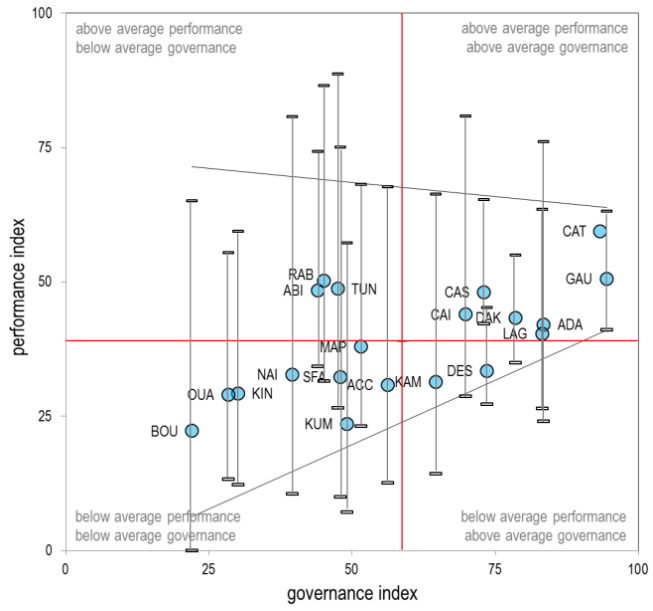


Figure D. Case city population, wealth and urbanization pressure comparison

Figure D1. Metropolitan city population

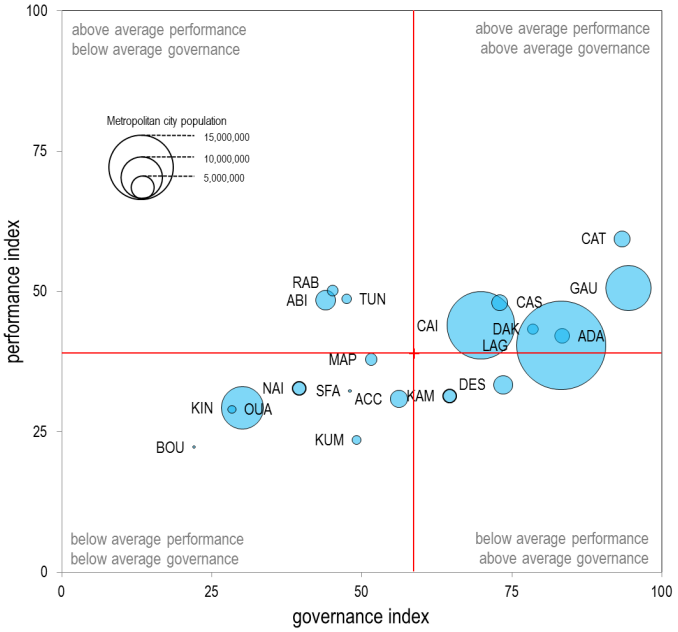


Figure D2. Gross domestic product / capital / annum

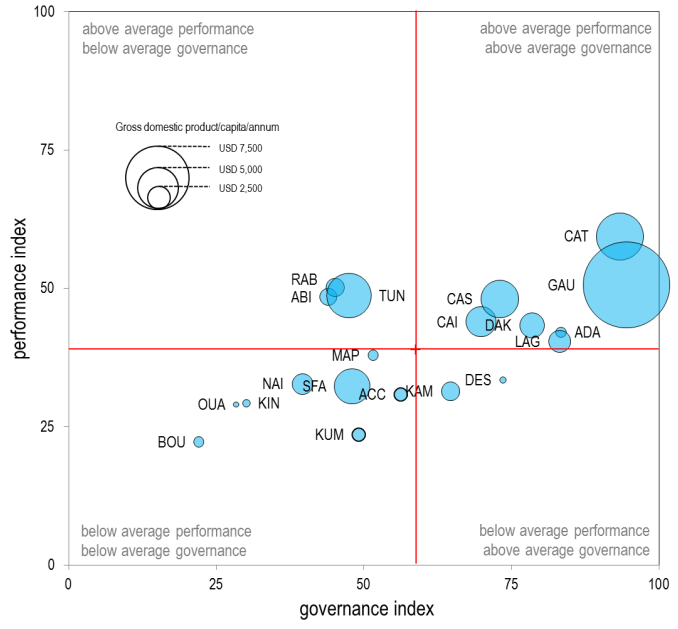


Figure D3. Urban percentage of national population

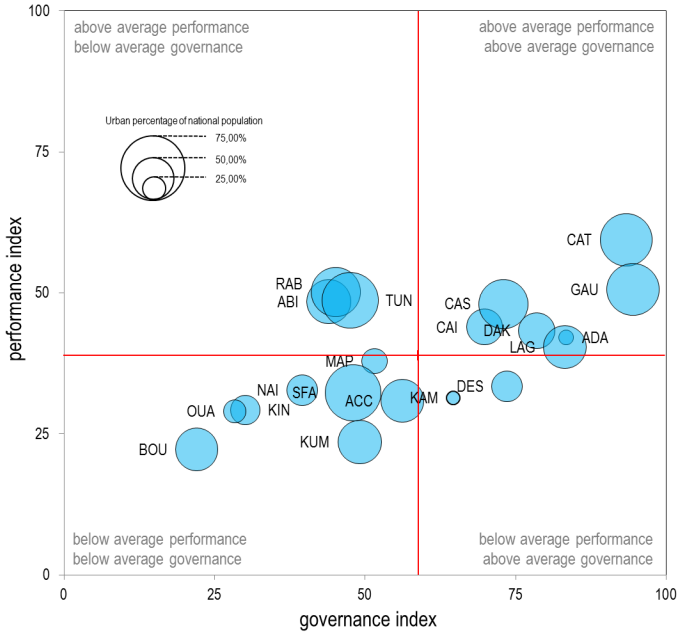
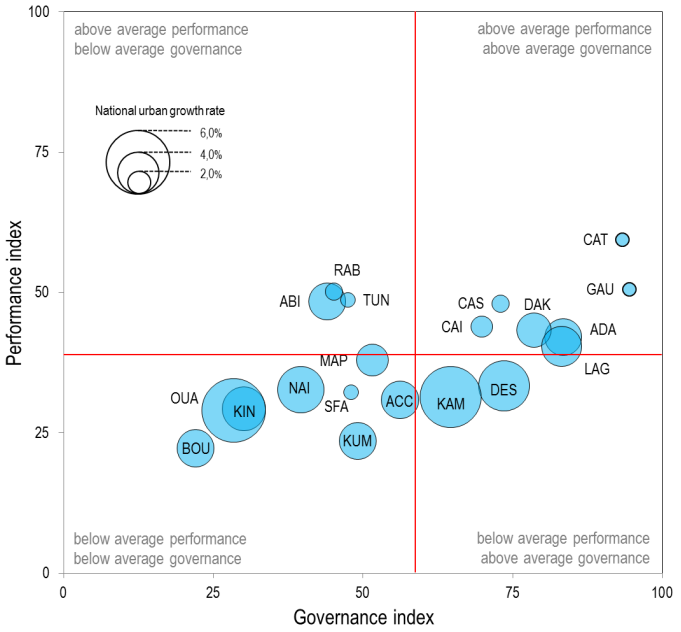


Figure D4. Urban percentage of national population



Bibliography

Hanchi, Fethi. . 2015. *"Situation de la mobilité en Tunisie."* ANME (Agence Nationale pour la Maîtrise de l'Energie).

Partnership on Sustainable Low Carbon Transport. 2014. "Climate Finance as the Engine for More Low-Carbon Transport, Recommendations to Policy Makers on Transport and Climate Change."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2014. "Urban Mobility Plans - National Approaches and Local Practice."

ESMAP. 2014. "Toward Sustainable and Energy Efficient Urban Transport." World Bank, Washington, DC.

Shape-It, Transport Era. 2014. "Guidelines for policy-makers."

UN Habitat. 2014. "The state of African cities 2014."

UNEP and UN Habitat. 2014. "Greener Cities Partnership."

ESMAP. 2014. "Formulating an Urban Transport Policy, Choosing Between Options." World Bank, Washington, DC.

Lammoglia, Adrien. 2013. *"Thèse "Analyse et modélisation multi-agents de transports flexibles, comparaison de services français et sénégalais."* Université d'Aix-Marseille et Université d'Avignon.

Laurent, François. 2013. *"T2 + T3 : PUD horizon 2025 et son PIP. "* Agence de développement municipal (ADM), Sénégal.

African Development Bank. 2013. Africa Development Bank organizational chart, September 2013.

Cities Alliance, Cities without Slums, CMI. 2013. "Urban space and poverty in Maputo, Mozambique."

City of Cape Town, 2013. "Draft 2013-2018 Integrated Transport Plan."

CLUVA, 7th Framework programme. 2013. "Responding to Climate Change in Africa, A guide for Action."

Hensher, David A., Walters, Jackie and Steel, Ruth. 2013. "Research in transportation economics." Elsevier.

GART (Association of Transport Authorities) and UTP (Union of Public Transport and Rail). 2013. "*Report modal et équilibre économique : deux enjeux pour l'avenir du transport public urbain.* "

Godard, Xavier. 2013. "Sustainable Urban Mobility in "Francophone" Sub-Saharan Africa."

IEA. 2013. "A Tale of Renewed Cities."

Arene, Ile-de-France and Espère, Senegal. 2013. "*Réalisation d'un diagnostic énergétique et bilan des émissions de gaz à effet de serre du Plan Climat Territorial Intégré de Dakar.* "

International Bank for Reconstruction and Development. 2013. "Sustainable Transport - what role in the global sustainable development agenda." World Bank, Washington, DC.

Replogle, Michael. 2013. "Transport and the post-2015 goal framework - sustainable transport and post 2015 development framework retreat." ITDP.

Journal of Sustainable Development in Africa. 2013. "Identifying major urban road traffic accident black-spots : a sub-city based analysis of evidences from the city of addis ababa, Ethiopia." Clarion University of Pennsylvani.

MAN Group. 2013. "What cities want."

Ministry of Construction, Housing, Sanitation and Urban Development, Cote d'Ivoire, Japan International Cooperation Agency. 2013. "*Projet pour le développement du schéma directeur d'urbanisme du Grand Abidjan en République de Côte d'Ivoire.* "

National Cooperative Highway Research Program. 2013. "Active Traffic Management for Arterials – A synthesis of highway practice." Synthesis 447.

National Center for Transit Research. 2013. "Integrating Transit with Road Pricing Projects."

OECD (Organization for Economic Co-operation and Development). 2013. "Better Regulation of Public-Private Partnerships for Transport Infrastructure."

Doczi, Julian, Dorr, Tobias, Mason, Nathaniel and Scott, Andrew. 2013. "The post-2015 delivery of universal and sustainable access to infrastructure services." Overseas Development Institute, London, UK.

OECD (Organization for Economic Co-operation and Development). 2013. "Spending on Transport Infrastructure 1995-2011, Trends, Policies, Data." International Transport Forum.

OECD (Organization for Economic Co-operation and Development). 2013. "Understanding the value of transport infrastructure - guidelines for macro-level measurement of spending and assets." International Transport Forum.

OECD (Organization for Economic Co-operation and Development) and UITP (International Association of Public Transport) 2013. "Funding Urban Public Transport Case Study Compendium."

SLoCaT (Partnership on Sustainable Low Carbon Transport).2013. "A Status Report on the Contribution of Sustainable Transport to the Implementation of Rio+20."

SLoCaT (Partnership on Sustainable Low Carbon Transport). 2013. "Bridging the gap - pathways for Transport in the Post 2012."

SLoCaT (Partnership on Sustainable Low Carbon Transport). 2013. "Global Consultation on Sustainable Transport in the Post-2015 Development Agenda."

SLoCaT (Partnership on Sustainable Low Carbon Transport). 2013. "Post 2015 Development Framework and Transport: a unique opportunity for transformational change."

SLoCaT (Partnership on Sustainable Low Carbon Transport). 2013. "Summary report on global consultation on sustainable transport in the Post-2015 development agenda."

SLoCaT (Partnership on Sustainable Low Carbon Transport). 2013. "Where does SLoCaT stand in realizing sustainable transport ?."

Huizenga, Cornie. 2013." The contribution of sustainable transport to the post 2015 development framework and global climate change mitigation." SLoCaT (Partnership on Sustainable Low Carbon Transport). and the Green Tree Foundation, New York.

Kingdom of Morocco, AFD (French Development Agency), CMI (Center for Mediterranean Integration), CERTU (Centre for studies on road networks, transport, urban planning and public construction), CODATU (Cooperation for Urban Mobility in the Developing World) and Transitec. 2013. "Report on national days on sustainable urban transport."

Salazar, F. Pablo and Behrens, Roger. 2013. "Paratransit and formal public transport operational complementarity: imperatives, alternatives and dilemmas."

Siemens. 2013. "Como, Facts, Trends and Stories on Integrated Mobility."

Africa Transport Policy Program (SSATP). 2013. "Efficient, safe, and sustainable transport for the people in Africa - SSATP third development plan 2014-2018."

Africa Transport Policy Program (SSATP). 2013. "Minutes of the SSATP development partner's meeting."

Africa Transport Policy Program (SSATP). 2013. "Operational plan - SSATP third development plan 2014-2018."

SECO (Swiss Confederation, State Secretariat for Economic Affairs). 2013. "Integrated Urban Infrastructure Development."

SYTRAL (Organizing Authority for Public Transport). 2013. "Presentation of the SYTRAL and CODADU (Cooperation for Urban Mobility in the Developing World) in Romania, Bucharest.

The World Bank. 2013. "Institutional Labyrinth designing a way out for improving urban transport services: lessons from current practice." Washington, DC.

UN Habitat. 2013. "Planning and design for sustainable urban mobility, global report on human settlements 2013."

UN Habitat. 2013. "Planning and design for sustainable urban mobility, global report on human settlements 2013 - Embargoed until 7 October 2013."

UN Habitat. 2013. "The relevance of street patterns and public space in urban areas."

UN Habitat and EMBARQ. 2013. "Developing an urban mobility plan." World Resources Institute, Washington DC.

UN Habitat and EMBARQ. 2013. "Establishing a multi-stakeholder forum for urban mobility draft, not for citation."

UN Habitat and EMBARQ. 2013. "How to establish a metropolitan transit authority draft, not for citation."

UN Habitat and EMBARQ. 2013. "How to establish an urban mobility compact, draft, not for citation."

WUF 7 (UN Habitat and World Urban Forum 7 2013). "Urban Equity in development - cities for life." Medellin, Columbia.

UNACLA (United Nations Advisory Committee of Local Authorities). 2013. "Transport and mobility snapshots."

UN Habitat. 2013. "Time to think urban."

UN Habitat. 2013. "Urban Planning for City Leaders."

UN Centre for Regional Development, UN Department for Economic and Social Affairs, Government of Indonesia (Ministry of Transportation), SLoCaT. (Partnership on Sustainable), Low Carbon Transport 2013. "Post 2015 Development Framework and Transport : a unique opportunity for transformational change."

World Bank. 2013. "Planning, connecting & financing cities-now." Washington, DC.

World Bank. 2013. "Transforming cities with Transit, Transit and Land-Use Integration for Sustainable Urban Development." Washington, DC.

WHO (World Health Organization) 2013. "Global Status report on road safety 2013."

WHO (World Health Organization) 2013. "Road Safety in the WHO African Region - The Facts 2013."

WHO (World Health Organization) 2013. "The Health Nexus – Delivering Health through Sustainable Energy, Transport and Cities."

2013. "Concept Paper on development of a post 2015 results framework on sustainable transport."

ADP *(Villes en Développement – Association de Professionnels)* 2012. *"Quels transports urbain pour les villes du Sud ? "*

Paulain, Thierry. 2012. *"L'Afrique en développement - Financer les villes d'Afrique, l'enjeu de l'investissement local. "*French Development Agency and the World Bank.

AFD (French Development Agency), CMI (Center for Mediterranean Integration), EIB (European Investment Bank), CODATU (Cooperation for Urban Mobility in the Developing World), World Bank, Transitec, and Urbaplan. 2012. *"Accessibilité des Médinas – guide d'orientation à l'intention des décideurs."*

AFD (French Development Agency), CMI (Center for Mediterranean Integration), EIB (European Investment Bank), City of Marseille – Plan Bleu, CODATU (Cooperation for Urban Mobility in the Developing World), CERTU (Centre for studies on road networks, transport, urban planning and public construction), MedCités and World Bank. 2012. "*Transports urbains durables en Méditerranée – Synthèse des séminaires 2010-2011."*

Kumar, Ajay, Zimmerman, Sam, Agarwal, O.P. 2012. "The Soft Side of BRT." Australian AID and SSATP (Africa Transport Policy Program).

UN-Habitat and ICLEI - Cities and Climate change initiative tool series. 2012. "Making Carbon Markets Work for your City : a guide for Cities in Developing Countries."

Cities for Mobility. 2012. "Safe Streets as a Sustainable Cities Strategy." Stuttgart, Germany.

CMI (Center for Mediterranean Integration), World Bank, AFD (French Development Agency), EIB (European Investment Bank), PAM, Plan Bleu, FEMISE (Meditereanean Institute). 2012. "*Vers une croissance verte en Méditerranée – mise en œuvre de politiques susceptibles d'accroître la productivité des actifs naturels. "*

CODATU XV(Cooperation for Urban Mobility in the Developing World), City Government of Addis Ababa, OnlyLyon (urban community and city of Lyon), AFD (French Development Agency), AACPPO (Addis Ababa City Planning Project Office), Lyon Town Planning Agency. 2012. "Transportation challenges in a booming

city – coordination of the mass transit network and urban development in Addis Ababa."

Cox, Wendell at CODATU XV (Cooperation for Urban Mobility in the Developing World). 2012. "Developing Africa : Toward Self-Sufficient, Customer Oriented Urban Transport."

Konan G. Yao at CODATU XV (Cooperation for Urban Mobility in the Developing World). 2012. *"Régulation des transports urbains dans l'agglomération abidjanaise : bilan et perspectives."*

DEMOGRAPHIA. 2012. "Demographia World Urban Areas (World Agglomerations."

Baeumler, Axel, Ljjasz-Vasquez, Ede, Mehndiratta, Shomik. 2012. "Directions in Development Countries and Regions - Sustainable Low-Carbon City Development in China." The World Bank, Washington, DC.

Lombard, Jérôme and Ninot, Olivier. 2012. *"Des mobilités aux transports. Regards croisés en Afrique de l'Ouest. "* EchoGéo.

Elsevier, Xavier Godard. 2012. "Comparisons of urban transport sustainability: Lessons from West and North Africa."

EMBARQ. 2012. "Evaluate, Enable, Engage, principles to Support Effective Decision Making in Mass transit investment Programs." World Resources Institute, Washington DC.

EMBARQ. 2012. "Road Safety Design Guidelines for Bus Rapid Transit in Indian Cities with consideration for local accessibility and traffic capacity." World Resources Institute, Washington DC.

World Bank - ESMAP, DFID (Department for International Development), ASSIST (Assessing the Social and Economic Impacts of Past and Future Sustainable Transport). 2012. " Planning for a Low Carbon Future."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2012. "Sustainable Urban Transport Project (SUTP) – Focus on Capacity Building."

International Transport Forum. 2012. "Key Transport Statistics 2012 Data."

International Transport Forum. 2012. "Policy Brief, Towards seamless public transport."

UNDP (United Nations Development Programme) 2012. "*Technologies mobiles et autonomisation : renforcer le développement humain par la participation et l'innovation. "*

Republic of Tunisia – Ministry of Transport, AFD (French Development Agency), CMI (Center for Mediterranean Integration), CERTU (Centre for studies on road networks, transport, urban planning and public construction), CODATU (Cooperation for Urban Mobility in the Developing World), Transitec, TRANSTU (Tunisian Railways National Company). 2012. "*Journées nationales sur le transport urbain durable."*

SSATP. 2012. "Benchmarking governance in the transport sector".

SSATP. 2012. "SSATP Annual report 2011 - a turning point for SSATP."

SSATP. 2012. "Urban Transport - Mobility and Accessibility cluster - minutes of stakeholders' meeting Addis Abada - October 26, 2012."

SSATP. 2012. "SSATP strategic priorities annual meeting, December 2012."

Pinard, Michael I. 2012. "Progress on Commercialized Road Management in Sub-Saharan Africa." SSATP.

2012. "Establishing appropriate public transport governance and management arrangements for the Gauteng City Regions (GCR). A Discussion Paper aimed at facilitating agreement on appropriate governance and management arrangements for public transport in the Gauteng City Region. Prepared by the 2030 Consortium as part of the preparation of the long term transport strategy for Gauteng."

Moffatt, S., Suzuki, H., Iizuka R. 2012. "Eco2 Cities Guide Ecological Cities as Economic Cities." World Bank, Washington DC.

UCLG (United Cities and Local Government). 2012. "*Tunisie : conférence sur la décentralisation : instrument fort pour la démocratie et le développement local."*

UN Habitat. 2012. "State of the World's Cities 2012/2013 Prosperity of Cities."

UN Habitat. 2012. "The State of Arab Cities 2012 – Challenges of Urban Transition."

UN Habitat. 2012. “World Urbanization Prospects the 2011 Revision – Highlights.”

UNEP. 2012. “Cities and Carbon Finance: a feasibility study on an urban CDM.”

UNEP, UN Habitat, GEF (Global Environment Facility), ICCT (International Council on Clean Transportation). 2012. “Cost and benefits of clean technologies for bus rapid transit (BRT), Summary of results for Addis Abada.”

UNEP, UN Habitat, GEF (Global Environment Facility), ICCT (International Council on Clean Transportation). 2012. “Cost and benefits of clean technologies for bus rapid transit (BRT), Summary of results for Kampala.”

UNEP, UN Habitat, GEF (Global Environment Facility), ICCT (International Council on Clean Transportation). 2012. “Cost and benefits of clean technologies for bus rapid transit (BRT), Summary of results for Nairobi.”

AFTUW (Africa Urban and Water Unit) 2012. “Good Urban Governance through ICT : Issues, Analysis, and Strategies.” World Bank, Washington, DC.

World Urban Forum 6. 2012. “Transformation of Traditional public Transport Industry.” Naples, Italy.

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH) and ADB (Asian Development Bank). 2011. “Changing Course in Urban Transport – an illustrated guide.”

AfDB (African Development Bank). 2011. “The Bank Group's Urban Development strategy – Transforming Africa's Cities and Towns into Engines of Economic Growth and Social Development.”

Heather, Allen. 2011. “Africa's first full rapid bus system : the Rea Vaya bus system.” Johannesburg, Republic of South Africa.

Little, D. Arthur. 2011. “The Future of Urban Mobility - towards networked, multimodal cities of 2050.”

World Bank. 2011. “Carbon finance in Africa.”

Dafflon, B. and Madiès, T. 2011. “*L'économie politique de la décentralisation dans quatre pays d'Afrique Subsaharienne, Burkina Faso, Sénégal, Ghana et Kenya.*” World Bank and AFD (French Development Agency).

Remoué, Bruno. 2011. "Etude d'intégration du volet transport dans l'aménagement du pôle culturel de la zone de la Gare de Dakar. " CETUD (Executive Council of Urban Transport). Dakar, Senegal.

CMI (Center for Mediterranean Integration), *Caisse de Dépôts,* World Bank, MedCities (Mediterranean Cities Network). 2011. "Towards a new Generation of Cities - guidebook for City Development Strategies in Southern Mediterranean Countries."

EMBARQ. 2011. "Bus Karo a Guidebook on bus Planning & Operations." World Resources Institute, Washington DC.

EMBARQ. 2011. "From here to there - a creative guide to making public transport the way to go." World Resources Institute, Washington DC.

(EMTA) European Metropolitan Transport Authorities. 2011. "EMTA barometer 2011."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Sustainable Urban Transport and Non-motorized Transport."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "An example of promoting Cycling in Cities – Components of a high Quality Bicycle Infrastructure."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Beyond the Fossil City: Towards low Carbon Transport and Green Growth."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Increasing and Volatile Oil Prices : Impact – Subsidies, Pricing Mechanisms and Taxes – Policy Responses – Recommended Reading List : UPDATE."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Measuring Public Transport Performance."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Mobility Management & Commuting: Inputs and Examples of Best Practice in German Firms."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Negotiating the Deal to enable the first Rea Vaya bus operating company, Agreements, Experiences and Lessons."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Planning for Cycling in Germany: Cycling Coordinators and Offices."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Reading List on, Financing Sustainable Urban Transport."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Reading List on, Low Carbon Transportation."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Reviving the Soul in Seoul: Seoul's Experience in Demolishing Road Infrastructure and Improving Public Transport."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Rising Automobile Dependency, How to break the trend."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Sustainable Transport Evaluation."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Sustainable Urban Mobility: The Example of Istanbul."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Urban Transport and Health."

Dimitriou, T. Harry, Gakenheimer, Ralph. 2011. "Urban Transport in the Developing World, a handbook of policy and practice."

Cervero, R., and Guerra, E. 2011. "Urban densities and transit: a multi-dimensional perspective - working paper." University of California, Berkeley - Institute of transportation studies.

International Transport Forum. 2011. "Key Mobility Challenges in Indian Cities." Geetam Tiwari Indian Institute of Technology - New Delhi, India.

DGAT (Ministry of Public Works - Republic of Tunisia), AFD (French Development Agency), IDEA Groupe, INGÉROP. 2011 *"Evaluation de la politique d'aménagement du territoire en Tunisie - études de cas. "*

Mezghani, Mohamed. 2011 "Le transport public : un enjeu vital pour les villes d'Afrique sub-saharienne. "

Van der Griend, R. A., and Siemonsma, W. 2011. "Introducing Sustainable Urban Transport: A case of Kampala, Uganda."

Inturri Giuseppe, Ignaccolo Matteo, Capri Salvo and Rubulotta Elena. 2011 "New trends in urban transport planning for sustainable mobility." SIDT Scientific Seminiar 2011.

Thompson, J. Bruce. "1987-2011 Africa's transport : A promising future." SSATP (Africa Transport Policy Program).

World Bank. 2011. "Improving Access to Urban Land for All Residents : Fulfilling the Promise." Washington, DC.

Kaganova, Olga. 2011. "Guidebook on Capital Investment Planning for Local Governments." World Bank, Washington DC.

Mitric, Slobodan. 2011. "Urban Transport projects : patterns and trends in lenging, 1999-2009." World Bank, Washington, DC.

UN Habitat, UATP (African Association of Public Transport) and GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2011. "Sustainable mobility for African Cities, promoting non-motorized transport options and compact cities as complements to public transport."

UN Habitat. 2011. "Infrastructure for Economic Development and Poverty Reduction in Africa."

UN Habitat. 2011. "People and Mobility - promoting non-motorized transport options and compact cities as complements to public transport."

UCLG (United Cities and Local Governments). 2011. "Sustainable transport how will your city get there."

UN Department of Economic and Social Affairs - Population Division. 2011. "Urban Agglomerations 2011."

World Bank. 2011. "Guide to Climate Change Adaptation in Cities." Washington, DC.

Gwilliam, Ken. 2011. "Africa's Transport Infrastructure – Mainstreaming Maintenance and Management." World Bank, Washington DC.

Wolf, P., Rye, T., O'Dolan, C., and Pressl R. 2010. "Report with lessons learnt from best practice studies and adaptation to local context."

ADB (Asian Development Bank) 2010. "Sustainable Transport Initiative - Operational Plan."

African Center for Cities. 2010. "Urbanization Imperatives for Africa."

May, A., and Marsden G. 2010. "Urban Transport and Mobility." OECD (Organization for Economic Co-operation and Development).

Prism (Publication of Arthur D Little). 2010. "The power of Innovation - The Future of Urban Mobility."

Gauthier A. and Weinstock A. 2010 "Africa : Transforming Paratransit into BRT." Built Environment vol 36 n° 3.

CDIA (Cities Development Initiative for Asia) 2010. "City Infrastructure Investment Programming & Prioritization Toolkit, user manual."

CODATU (Cooperation for Urban Mobility in the Developing World). 2010. *"L'action internationale des collectivités territoriales en matière de déplacements urbains."*

EMBARQ. 2010. "Lessons learned from major bus improvements in Latin America and Asia - Modernizing Public Transportation." World Resources Institute, Washington DC.

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Accessing Climate Finance for Sustainable Transport : a practical overview."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "BRT System of Bangkok, Thailand."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Financing Sustainable Urban Transport."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Informal Public Transport, Recommended Reading and Links."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Inspection & Maintenance and Roadworthiness."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Parking Management a contribution Towards Liveable Cities."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Public Bicycle Schemes : Applying the Concept in Developing Cities."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Public Transport Integration, Recommended Reading and Links."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Recommended Reading and Links on Non-Motorized Transportation."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Recommended Reading and Links on Public Bicycle Schemes."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Transport Alliances."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Transport and Climate Change."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Urban Freight in Developing Cities."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Urban Road Safety."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2010. "Urban Transport and Health, Recommended Reading and Links."

IAU Île-de-France (Paris Region Planning and Development Agency). 2010. *"Le Maroc s'ouvre au XXIe siècle."*

Un Habitat and Cities Alliance. 2010. “Housing the poor in African cities.”

Houpin, Sylvain. 2010. “Mobilité urbaine et développement durable en méditerranée : diagnostic prospectif régional.”

Kumar, A., and Diou, C. 2010. “The Dakar Bus Renewal Scheme – Before and After.” SSATP discussion paper No. 11, World Bank, Washington, DC.

SSATP and LAMATA Conference. 2010. “Challenges of the Lagos Urban Transport Project.”

SUMA (Sustainable Urban Mobility in Asia). 2010. “A Framework for Achieving Sustainable Urban Mobility in Asian - CAI-Asia (Cities Clean Air Initiative for Asian Cities).”

World Bank. 2010. “Systems of Cities: Harnessing urbanization for growth and poverty alleviation.” Washington, DC.

Suzuki, H., Dastur, A., Moffatt, S., Yabuki, N. and Maruyama, H. 2010. “Eco2 Cities Ecological Cities as Economic Cities.” World Bank, Washington, DC.

UITP (International Association of Public Transport) and UATP (African Association of Public Transport) 2010. “Research road map for public transport in Africa.” TransAfrica Project.

Sakamoto, K., Dakmann H., and Palmer D. 2010 “T-MAPPER : Transport Measures and Policies to Promote Emission Reductions - Final Report.”

Mezghani, Mohamed. 2010. “Quelle autorité organisatrice pour les transports publics en Afrique.”

UITP (International Association of Public Transport) and UATP (African Association of Public Transport). 2010. “Public Transport in Sub-Saharan Africa - Major trends and case studies.” TransAfrica Project.

Candiracci S., Schlösser C., Allen, H., Kunz, Y., and O'Reilly, D. 2010. “A new perspective Sustainable Mobility in African Cities.” UN Habitat.

UN Habitat. 2010. “The State of African Cities 2010 - Governance, Inequality and Urban Land Markets.”

UCLG (United Cities and Local Governments). 2010. "Policy paper on urban strategic planning : Local leaders preparing for the future of our cities."

United Nations Centre for Regional Development and the Ministry of the Environment - Government of Japan. 2010. "Environmentally Sustainable Transport for Asian Cities : a sourcebook."

Kim, Patricia and De Jong, Rob. 2010. "High time to change road investment patterns in Africa."

World Bank. 2010. "Cities and Climate Change: an urgent agenda." Washington, DC.

Leather, James. 2009. "Rethinking Transport and Climate Change." ADB (Asian Development Bank).

Godard, Xavier. 2009. *"Qui paie quoi en matière de transports urbains ? Etude de cas ville de Tshwane."* AFD (French Development Agency) and CODATU (Cooperation for Urban Mobility in the Developing World).

World Bank. 2009. "Systems of Cities: Harnessing urbanization for growth and poverty alleviation."

UCLG (United Cities and Local Governments). 2009. "Agenda 21 for Urban Mobility."

CODATU (Cooperation for Urban Mobility in the Developing World). 2009. *"Qui paie quoi en matière de transports urbains ? Guide de bonnes pratiques."*

Pai, Madhay. 2009. "Transport in Cities India Indicators." EMBARQ India.

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2009. "Adapting Urban Transport to Climate Change."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2009. "Air Quality Management."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2009. "Demystifying Induced Travel Demand."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2009. "Intelligent Transport Systems."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2009. "Noise and its Abatement."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2009. "Road Safety, Recommended Reading and Links."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2009. "Social Change and Urban Transport."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2009. "Transport, Cycling-Inclusive Policy Development : A Handbook."

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH). 2009. "Transportation Demand Management" training Document."

Schipper, Lee. 2009. "Transport and Co2 Emissions : a new framework for a new challenge." University of California - Berkeley and Stanford University.

Godard, Xavier and Vallouis, Philippe. 2009. *"Synthèse de l'atelier de restitution de l'étude "mobilité urbaine à Tunis, évolutions et perspectives."*

SICTA (Société ivoirienne du contrôle technique automobile). 2009. *" Le contrôle technique automobile, un luxe pour l'Afrique ? Etude d'un cas ivoirien."*

Mitiku, N. Tesfamichael. 2009. "A Framework for a Pro-growth, Pro-poor Transport Strategy." SSATP Working Paper No.89. World Bank, Washington, DC.

UITP (International Association of Public Transport). 2009. *"Aperçu du transport public en Afrique Subsaharienne."* TransAfrica Project.

Akoubi, Brahim and Dimassi, Hassine. 2009. *"Transport en commun dans le Grand Tunis à l'horizon 2020."* Université Virtuelle de Tunis.

World Bank. 2009. "Systems of Cities - Harnessing urbanization for growth and poverty alleviation." Washington, DC.

Godard, Xavier. 2009. *"Mobilité urbaine en Afrique : quels modèles et quelles inflexions face aux défis de l'énergie et du climat ? "*

Kumar, Ajay and Barrett, Fanny. 2008. "Stuck in traffic: Urban Transport in Africa." World Bank, Washington DC.

CERTU (Centre for studies on road networks, transport, urban planning and public construction). 2008. *"Comment élaborer des stratégies de mobilité durable dans les villes des pays en développement."*

Thiam, Alioune. 2008. *"Mobilité et accès aux services urbains de proximité à Dakar: cas des quartiers sous-intégrés."*

Cities Alliance - Cities without Slums. 2008. "Understanding Your Local Economy: A Resource Guide for Cities."

CODATU(Cooperation for Urban Mobility in the Developing World), World Bank, KNA-MENA, French Republic and INERTS (French national institute for transport and safety research). 2008. "Urban Transport in the Mediterranean Region – Guidance and recommendations."

Finken, Martin. 2009. *"Etat de la Mobilité dans les Villes Africaines."*

International Transport Forum. 2008. "Privatisation and regulation of urban transit systems." OECD (Organization for Economic Co-operation and Development).

UN Habitat. 2008. "Senegal: Urban Profile of Dakar."

Chabbi, Morched and Abid, Hassen. 2008. *"La mobilité urbaine dans le Grand Tunis évolutions et perspectives."*

UITP (International Association of Public Transport). 2008. "Overview of public transport in Sub-Saharan Africa." TransAfrica Project.

World Bank. 2008. "A Framework for Urban Transport Projects Operational Guidance for World Bank Staff." Washington DC.

Mitric, Slobodan. 2008. "Urban Transport for Development - Towards an Operationally Oriented Strategy."

World Bank. 2008. "Safe, Clean, and Affordable Transport for Development – The World Bank Group's Transport Business Strategy for 2008-2012."

UCLG (United Cities and Local Governments). 2008. "The new UCLG Committee on Urban Mobility."

ABD (Asian Development Bank) and EIB (European Investment Bank). 2007. "The Climate Change Agenda."

ISTED (Institut des Sciences et des Techniques de l'Equipement et de l'Environnement pour le Développement) and AFD (French Development Agency). 2007. "*Villes en devenir "Des clés pour comprendre et agir."*

Cities Alliance - Cities without Slums. 2007. "Understanding your Local Economy - A Resource Guide for Cities."

Cities Alliance - Cities without Slums. 2007. "Livable Cities – the benefits of urban environmental planning."

Eurocities, the network of major european cities. 2007. "Eurocities for sustainable Urban Mobility Strenght through diversity."

GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit). 2007. "Bus Rapid Transit Planning Guide."

GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit). 2007. "Gender and Urban Transport : Smart and Affordable."

GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit). 2007. "The CDM in the Transport Sector."

Ardila, Artzro. 2007. "How Public Transportation's Past Is Haunting Its Future in Bogota, Colombia." Journal of the Transportation Research Board.

OECD (Organization for Economic Co-operation and Development). 2007. "Managing urban traffic congestion." ECME European Conference of Ministers of Transport.

SSATP. 2007. "Second Development Plan 2008-2011, Fostering Sound Policies and Strategies for the Provision of Reliable, Safe, Efficient, and Affordable Transport." World Bank, Washington DC.

UNECA (United Nations Economic Commission for Africa). 2007. "*Situation des transports en Afrique.*"

Universidad Politecnica Valencia. 2007. "*SCP/LA21 en Arequipa - serie : Estrategia de Apoyo a la Gestion Urbano Ambiental.*"

Kassi, Irène. 2007. *"Régulations des transports populaires et recomposition du territoire urbain d'Abidjan."* University Michel de Montaigne - Bordeaux III.

Fofana, Zoro. 2007. *"Dysfonctionnements urbains et mobilité urbaine à Abidjan."*

ADB (Asian Development Bank), Center for Transportation and the Environment (World Resource Institute) and Sida (Swedish International Cooperation Agency). 2006. "Sustainable Urban Transport in Asia Making the Vision a Reality." Clean air Initiative for Asian Cities Program.

ATC (Australian Transport Council). 2006. "National Guidelines for Transport System Management in Australia."

Lomme, Roland and Vircoulon, Thierry. 2006. *"La régulation des transports informels à l'épreuve de la "guerre des taxis" collectifs en Afrique du Sud."*

Kessides, Christine. 2006. "The Urban Transition in Sub-Saharan Africa – implications for Economic Growth and Poverty Reduction." Cities Alliance, Sida (Swedish International Cooperation Agency) and World Bank.

Cities Alliance - Cities without Slums. 2006. "Guide to City Development Strategies Improving Urban Performance."

Nygaard, Nelson. 2006. "Bus Rapid Transit for Dar es Salaam City Centre Street Typology." Consulting Associates.

BMZ (German Federal Ministry for Economic Cooperation and Development). 2006. "The Inclusive City – Documentation of a joint networking event of the German Federal Ministry for Economic Cooperation and Development (BMZ) and the Cities Alliance." World Urban Forum June 3 – 21 2006. Vancouver.

GTZ (Gesellschaft für Technische Zusammenarbeit). 2006. "Training Course -2nd edition : Public awareness and behavior change in sustainable transport."

Rodrigue, J. P., Comtois, C., and Slack, B. 2006. "The Geography of transport systems."

Frey, Peter. 2006. "The South African Minibus Taxi Industry." University of Cape Town - School of Architecture, Planning and Geometrics.

Mobereola, Dayo. 2006. "Strengthening Urban Transport Institutions – a case study of Lagos State." SSATP Discussion Paper No. 5. World Bank, Washington DC.

CIRT (Central Institute of Road Transport). 2005. "Sustainable Urban Transport for Pune Metropolitan Area."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2005. "Bus Rapid Transit."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2005. "Car-Free Development."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2005. "EcoDriving."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2005. "Mass Transit Options."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2005. "The Role of Transport in Urban Development Policy."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2005. "Cleaner Fuels and Vehicle Technologies."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2005. "Natural Gas Vehicles."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2005. "Non-motorized Transport – Training Course."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2005. "The Role of Transport in Urban Development Policy."

Tehe, N'Guessan. 2005. *"Organisation des transports collectifs urbains en Afrique, le cas d'Abidjan : analyse et propositions, rapport de thèse."*

SSATP and the Ministry of Transport – Côte d'Ivoire. 2005. "Process Analysis of National Transport Policies and Trategies and Poverty Reduction – Final Report."

Smith, Adam. 2005. "A study of urban transport institutional, financial and regulatory frameworks in large Sub-Saharan African Cities." SSATP Working Paper No. 82. World Bank, Washington DC.

Pardo, Carlos. . 2005. "Bus Rapid Transit : A Global Review." Lloyd Wright University College, London.

ADB (Asian Development Bank), Center for Transportation and the Environment (World Resource Institute) and Sida (Swedish International Cooperation Agency). 2005. "Xi'an Sustainable Urban Transport Study - Final Report."

Lomme, Roland. 2004. *"La réforme des transports publics urbains à l'épreuve de l'intégration du secteur informel."*

GTZ (Gesellschaft für Technische Zusammenarbeit). 2004. "Bus Regulation and Planning."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2004. "Economic Instruments."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2004. "Land Use Planning and Urban Transport."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2004. "Mobility Management."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2004. "Urban Transport Institutions."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2004. "Training Course : Bus Regulation and Planning – Bus Sector Reform."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2004. "Training Course : Mass Transit."

TRL (Consulting firm). 2004. "The demand for public transport : a practical guide."

URB-AL (Regional cooperation programme involving sub-national governments of the EU and Latin America). 2004. "Integration of both the transportation and the urban planning within the frame of the sustainability and the 21 local agenda."

Bonnafous, A. 2003. "Une analyse de la base UITP sur les systèmes de transports urbains de 100 villes du monde." Commissariat général du plan.

GTZ (Gesellschaft für Technische Zusammenarbeit). 2003. "Preserving and Expanding the Role of Non-motorized Transport."

SSATP. 2003. "Urban Transport Services in Sub-Saharan Africa – Improving Vehicle Operations." SSATP Working Paper No. 75. World Bank, Washington DC.

Braithwaite, Mary. 2003. "SSATP Review of National Transport and Poverty Reduction Strategies – Guidelines." SSATP Working Paper No. 75. World Bank, Washington DC.

UITP (International Association of Public Transport). 2003. "Pour une meilleure mobilité urbaine dans les pays en développement."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2002. "Private Sector Participation in Urban Transport Infrastructure Provision."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2002. "Raising Public Awareness about Sustainable Urban Transport."

GTZ (Gesellschaft für Technische Zusammenarbeit). 2002. "Two and Three Wheelers."

Clark, Peter and Crous, Wilfred. 2002. "Public transport in metropolitan Cape Town : past, present and future."

World Bank. 2002. "Cities on the Move: World Bank Urban Transport Strategy Review." Washington DC.

World Bank. 2002. "Dar es Salaam case study overview – climate change, disaster risk and the urban poor : cities building resilience for a changing world." Washington DC.

SSATP. 2002. "Scoping study Urban mobility in three cities." SSATP Working Paper No. 70. World Bank, Washington DC.

CODATU (Cooperation for Urban Mobility in the Developing World). 2001. "Transport in South Africa - Meeting the Transport Challenges in Southern Africa."

Bi Nagonè, Zoro. 2001. *"Transports urbains et coordination institutionnelle - Premiers enseignements."* AGETU (Agence des transports Urbains).

Barter, Paul. .2001. "Linkages between Transport and Housing for the Urban Poor: Policy Implications and Alternatives." SUSTRAN Resource Centre, Kuala Lumpur, Malaysia.

State Ministry in charge of Infrastructure and Transport – Republic of Côte d'Ivoire. 2000. *"Ordonnance n°2000 - 67 du 9 février 2000 déterminant les principes fondamentaux du régime des transports terrestres."*

State Ministry in charge of Infrastructure and Transport and Ministry of Economy and Finance – Republic of Côte d'Ivoire. 2000. *"Décret N°2000-99 du 23 février 2000 portant création et organisation de la société d'Etat dénommée "Agence des transports Urbains."*

UITP (International Association of Public Transport). 2001. "Better Mobility in Urban Areas."

Maatz, Andreas. 2010. "Mega events – pacemaker of sustainable urban transport concepts, Issues/Recommendations/reading List." GTZ (Gesellschaft für Technische Zusammenarbeit).

Kumar, Ajay. 2010. "Urban Transport : Looking Forward – Lima/Bogota (before)/Lagos/Dar es Salaam." Presentation at the 2010 SSATP Annual Meeting in Kampala, Uganda.

Houpin, Sylvain. 2010. *"Extrait rapport mobilité urbaine Tunis." Plan bleu.*

SSATP. 2011. "Africa Road Safety Policy Framework - a platform for the implementation of the Decade of Action for Road Safety : 2011-2020." World Bank, Washington DC.

Sieber, Niklas. 2012. "Fighting Corruption in the Road Transport Sector : Lessons for Developing Countries." GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH) and BMZ (German Federal Ministry for Economic Cooperation and Development).

Bohler-Baedeker, S. and Huging, H. 2012. "Urban Transport and Energy Efficiency." GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH) and BMZ (German Federal Ministry for Economic Cooperation and Development).

Rogar, Mohamed and Meite, Youssouf. 2012. *"Transport urbain à Abidjan et problématique de développement durable."*

UNCLA (United Nations Advisory Committee of Local Authorities) and UN Habitat. 2012. "UNACLA highlights the importance of sustainable transport networks for cities and towns."

UN DESA (United Nations Development of Economic and Social Affairs), Ministry of Transportation of the Government of Indonesia, United Nations Center for Regional Development and SLoCaT (Partnership on Sustainable Low Carbon

Transport). 2013. "Aide memoire - Global Consultation on sustainable Transport in the post-2015 development Framework."

Cités Unies France, AFD (French Development Agency), CODATU (Cooperation for Urban Mobility in the Developing World) and GART (Association of Transport Authorities). 2013. "*L'action internationale des collectivités en matière de mobilité urbaine – Pourquoi et comment accompagner les villes en développement.*"

Gauteng Provincial Government – Republic of South Africa. 2013. "Gauteng 25-Year integrated Transport Master Plan."

Gorham, Roger. 2014. "Towards a new paradigm for the Transport Sector." Africa Sustainable Transport Forum – Nairobi, Kenya.

Salazar, F. P. and Behrens R. 2015. "From direct to trunk-and-feeder public transport services in the Urban South : Territorial implications."

AfDB (African Development Bank) ._____. "BRT Guidance note."

Cities for Mobility. ._____. "What is "Cities for Mobility?" www.cities-for-mobility.org

Leonard, Jean-Louis. ._____. "*Bonnes pratiques dans l'organisation et la gestion du transport collectif métropolitain : exemple français.*"

Leonard, Jean-Louis ._____. "*Bonnes pratiques dans l'organisation et la gestion du transport collectif métropolitain : Exemple français.*"

EMBARQ India. ._____. "12 Indian Cities: Transport Indicators."

Municipality of Tunis. ._____. "*Actualisation du plan de circulation de la ville de Tunis.*"

SLoCaT (Partnership on Sustainable Low Carbon Transport).2013. ._____. "Work Program 2013-2014 - From Breakthrough to breakout."

PIDA (Program Infrastructure Development for Africa), AU (African Union), NEPAD (New Partnership for Africa's Development) and AfDB (African Development Bank). ._____. "*Programme pour le développement des infrastructures en Afrique – interconnecter, intégrer et transformer un continent.*"

Williams, Brian. ._____. “Sustainable Urban Transport in Africa: Issues and Challenges.” UN Habitat.

World Bank. ._____. “World Bank Group Infra-structure Action Plan Africa Region.” Washington DC.

World Bank. ._____. “World Bank Group Infrastructure Action Plan Middle East & North Africa Region.” Washington DC.