THE GREEN HEART OF AFRICA
NAIROBI: A WORLD CLASS AFRICAN METROPOLIS
THE SEVEN KEY RESULT AREAS:

The seven Key Result Areas are all interlinked and the challenge is to integrate the goals of these in a comprehensive plan for the entire Region.

In terms of creating a Regional Development Plan for the Region, we have analysed the goals and ambitions in the seven Key Result Areas and related them to the types of integrated planning issues that could be addressed within the framework of a Regional Development plan.

In order to integrate studies and analysis within related professional fields, we have chosen to group the studies within 6 areas, each with a related planning document to direct focus of the studies to be performed.


MOBILITY & ACCESSIBILITY: Integrated Metropolitan Transport Strategy, based on an efficient and sustainable mass transit system, busses, park & ride facilities and a high focus on creating new bicycle lanes. Related KRA: Mobility & Accessibility

REGIONAL & MUNICIPAL PLANNING: Regional Development Plan This will be the most central team, integrating and coordinating all other studies. Related KRA’s: Inclusive economy, Quality of Life, Image & Branding

URBAN PLANNING & ARCHITECTURE: Public Space Design Concept, describing principles of creating attractive public spaces, based on urban and landscape qualities. KRA: Safety & Security, Quality of Life

LANDSCAPE PLANNING: Integrated Landscape Management Strategy with recommendations and guidelines within (urban-) forestry, (-urban) agriculture, conservation areas, national parks etc, to be implemented in the Regional Development Plan. KRA: Quality of life

GOVERNANCE SYSTEMS: Digital web portal is considered the most important tool in relation to a Regional Development Plan ensuring coordination, transparency, effectiveness in data handling and an always up to date planning document. KRA: Governance systems

CLIMATE CHANGE – A CHALLENGE FOR THE FUTURE

During the past 5 to 10 years, all international researchers in the field of climate change have come to the common conclusion that the climate is changing rapidly all over the world due to man-made greenhouse gas emissions. Urban planning is one of the most effec-
Active tools to handle the effects of climate change both in terms of mitigation and adaptation and we therefore suggest that it is included in the process as it is highly connected to the goals laid down in the area of sustainable development. A low carbon–sustainable development could be part of the unique image that the NMR is building - a strategy that is at the same time very much in focus in terms of potential investors, tourists and donors. The Intergovernmental Panel of Climate Change of the UN (IPCC) has prepared several reports on the issue, all concluding that the most probable scenario for the future will include that:

- the sea levels rise
- many countries will suffer from severe drought
- rainfalls will be more scarce than today in many areas
- rainfalls will – when they occur – be much more intense than today

All over the world governments are trying to cope with this information and to take the necessary measures in order to avoid the catastrophes which might be the result of these forecasts.

The IPCC and the International Energy Agency have come up with many recommendations for governments and industries in order to avoid and/or reduce the effects of these forecasts.

Among these recommendations, we can outline the following in relation to the Nairobi Metropolitan Region:

- Energy production should be based on renewable energy sources.
- Measures should be taken to avoid flooding when severe rainfalls occur.
- Water supply and water resources will be critical and therefore rainwater should be collected to the highest degree possible.
- Wastewater should be treated and recycled as to the highest degree possible.
- All biological waste material such as excess wood, grass, organic waste etc. should be utilised to create biofuels.

Responding to these challenges in due time and in a coordinated way will be the most important tool to make future urban areas prosperous as also pointed out by the International Scientific Congress on Climate Change, ‘Global Risks, Challenges and Decisions:

“Incorporating multidimensional adaptive strategies into current urban development strategies will result in an efficient use of scarce financial, technical, human, and natural resources, particularly in poor countries and emerging economies. A critical step in this direction is to assist policy makers, urban planners, and stakeholders in incorporating adaptation strategies and define alternative and sustainable paths of urban growth. A tremendous opportunity to integrate development, mitigation, and adaptation strategies to create more resilient urban areas is available. Further delays in developing and implementing adaptation strategies will have severe consequences for millions of urban inhabitants and ultimately local and national economies.

The concept of leapfrogging:

Acting in due time and not repeating the same mistakes as the developed countries, also constitutes a unique opportunity to create world-class urban solutions.
The so-called ‘leapfrogging’ – where countries or regions skip inferior, less efficient, more expensive or more polluting technologies and industries and move directly to more advanced ones – is an obvious opportunity for the Nairobi Region. In terms of energy planning, developing countries need not repeat the mistakes of highly industrialised countries in creating an energy infrastructure based on fossil fuels but “jump” directly to renewable energy sources and more efficient technologies.

As a consequence of these recommendations, it is obvious that the master plan for the Nairobi Metropolitan Region should take these recommendations into severe consideration. It is a little bit premature to come up with detailed conclusions as to the measures to be taken but it is obvious that the following outlines should be considered:

**Adaptation to climate change**
One of the most crucial perspectives from the IPCC in relation to the zone around the equator is a prediction that the overall rainfall will decrease. This would lead us to the recommendation that water will be a costly resource in the future necessitating an even more careful use of the scarce resource. At present, water is a shortage, both in terms of water supply and the hydro-power systems in the region. Emphasis and measures should be taken in order to increase wastewater treatment and recycling together with the storage of water from rainfall periods and, if possible, to increase ground water resources.

Storm water from heavy rainfalls is already a constant threat to a lot of people in the region living close to the rivers and streams. In order to cope with even heavier rainfalls in the future, which will increase the run-off from surfaces, we recommend that the Nairobi Metropolitan Master Plan takes into consideration the needs of green corridors in which storm water can be retained by creating intentional flooding areas for retention of storm water.

**CREATING THE MOST SUSTAINABLE METROPOLITAN AREA IN THE WORLD**
Related to the Key Result Area : Deploying World-Class Infrastructure and Utilities for the Region

The goal of becoming the most sustainable region in the world is realistic, as the Metropolitan Area is endowed with an attractive combination of carbon neutral energy resources, a climate with minimal need for heating and cooling, sufficient potential for local food supply etc. To achieve this goal, an Integrated Resource Management Plan needs to be developed.

**Sustainable energy supply**
At present, most of the power supply in the Nairobi Metropolitan Area is based on hydropower and, to a smaller degree, on geothermal power. Since these are both renewable energy sources, the Nairobi Region has a great basis for leapfrog fossil-based energy systems, which most countries are struggling to convert into more renewable energy systems. The Nairobi Region has the pos-
sibility of increasing the number of renewable energy sources and create a solid renewable power system to supply both the energy sector and the transportation sector.

Introducing renewable energy quantities in a system needs balancing between day and night and over the year. It is obvious that the need for storing energy will be huge in an electrically based region like the Nairobi Metropolitan Region. At the same time, the use of geothermal power, which can be regulated, and the huge hydropower systems already in place could constitute the appropriate regulation systems. Never before has any country in the world attempted to use hydropower systems for balancing renewable power by pumping water from downstreams into reservoirs during periods when the energy supply from e.g. wind turbines is high, thus creating the potential for utilizing these quantities of water for hydropower during calmer periods.

However good the perspectives are, the current situation is that there has been water shortage reflecting instability in the power supply. Therefore, it is necessary to look into other renewable sources to create a stable and CO2-neutral energy supply for the future. Low-cost electricity is the key to the conversion from charcoal, which is one of the biggest sources of pollution in Nairobi. The poorest part of the population simply cannot afford electricity. For some purposes, cooking stoves, heavy transportation biomass or bio fuels could be relevant alternatives to charcoal and fossil fuels.

Geothermal
The Rift Valley, not far from Nairobi, has a huge potential for geothermal power production and the first plant was already established 30 years ago. Today, geothermal energy constitutes around 15% of energy consumption in Kenya, and the areas in the Rift Valley around Hells Gate are estimated to have a potential of no less than 1000 MW annually. We recommend that even more focus should be put on the possibility of producing much more energy from geothermal resources in the Rift Valley. Since both geothermal power and hydropower can be regulated according to specific demands, they form a great backbone in energy supply making it possible to utilise more fluctuating sources such as wind and sun power.

Wind
Wind turbines could be established along the escarpment and Ngong Hills (as well as in high potential areas approximately 200 km’s north of Nairobi), in order to make use of the different altitudes and create regular winds and thereby a renewable resource of high potential.

In many areas of the world such as California, Denmark, Spain etc., we see that wind turbines now play a much more significant role than before. Today, wind turbines produce up to 50% of energy in Spain and we recommend that this potential be taken into consideration when detailing the Nairobi Regional Plan.

Forestry

Geothermal energy
Sun
Sun is a renewable energy resource, which we should make use of in the future. Photovoltaics (PV) will play a major role in many cities around the world. World-class cities emerging in the Middle East have started to make use of this potential although the capital costs are rather high at the moment. Predictions are that the cost of photovoltaics will decrease in the future making it much more feasible to use this technology on buildings and as an energy source in entire cities or areas such as the Nairobi Metropolitan Region. The use of photovoltaics should be taken into consideration in the Regional Development Plan where areas suited for photovoltaics should be pointed out.

Biomass for Bio Fuels
Introducing world-class electrical infrastructure will make it possible to meet most of the transportation and public power needs in 10 to 20 years by means of a renewable, electrical power system.

The problem of energy consumption in huge industries remains. Examples are cement factories, brickwork, burnings and the like, which require huge amounts of energy. In addition, transports with huge trucks over long distances and aeroplanes cannot be fuelled by electrical power. In order to cope with these factors, biomass conversion to biofuels is employed all over the world. In Brazil, sugar canes are used for producing bioethanol for cars and trucks and in Europe and Southeast Asia, huge areas are reserved for producing rape seed or palm oil, which is converted into biodiesel in order to fuel trucks, planes and ships. In an environmental and social perspective, it is important that the production of biofuels in the future do not replace forests or food production. We recommend that the potential of growing Jatropha or other similar bio plants for creating biofuels should be taken into consideration in areas where very little water is available for growing human food in the future. Areas suitable for this purpose should be pointed out in the Nairobi Regional Plan.

Biomass for Cooking Stoves
On a local level, there are various issues regarding the use of inefficient charcoal-fuelled cooking stoves inside the homes of the Nairobi Region, which severely affect the biomass resource in the region, contributing to the deforestation of the Region.

Although several initiatives are currently addressing the problem, including providing improved charcoal-fuelled stoves for many of the citizens, there are still a number of issues to be dealt with:

- Many people are experiencing the health damaging effects of alarming levels of carbon monoxide inside their kitchens as the current improved stoves do not have a chimney.

The UN goals for sustainable development is around 1.5 tonnes CO2 / capita / year. Kenya already meets that goal. Without boasting, it can be said that Kenya is a world leader in sustainability. Today a large part of the population lives directly off the earth and has no real consumption. The challenge for Nairobi will be to maintain this low emission rate when the city doubles its inhabitants.

**Kenya: A World Leader in Sustainability**

The problem of energy consumption in huge industries remains. Examples are cement factories, brickwork, burnings and the like, which require huge amounts of energy. In addition, transports with huge trucks over long distances and aeroplanes cannot be fuelled by electrical power. In order to cope with these factors, biomass conversion to biofuels is employed all over the world. In Brazil, sugar canes are used for producing bioethanol for cars and trucks and in Europe and Southeast Asia, huge areas are reserved for producing rape seed or palm oil, which is converted into biodiesel in order to fuel trucks, planes and ships. In an environmental and social perspective, it is important that the production of biofuels in the future do not replace forests or food production. We recommend that the potential of growing Jatropha or other similar bio plants for creating biofuels should be taken into consideration in areas where very little water is available for growing human food in the future. Areas suitable for this purpose should be pointed out in the Nairobi Regional Plan.
In many places in Kenya, the charcoal yield is only around 8.3%, which means that 10 tons of newly harvested forest wood (with a moisture content of 100%) are converted into as little as 0.83 tons of charcoal (with a water content of 5%). This indicates that the environmental aspects are currently not addressed, as the low efficiencies of charcoal production are associated with large amounts of GHG emissions.

With the introduction of a new improved wood-fired stove, deforestation and emissions will be slowed down dramatically, as the energy content of the wood will be used much more efficiently in the kitchens. By using an improved wood-fired stove in instead of the current charcoal stove, the amount of wood used for preparing the same amount of food is reduced by seven. In addition, the indoor environment of the kitchens is improved, as a chimney will make sure that the harmful substances are led out of the kitchen. On a longer term, electrical stoves should replace the wood-fired stoves altogether.

Waste Management and Sewage
A proper waste management and sewage is a key factor in relation to improving sanitation and make better use of scarce resources, especially water. A traditional modern sewage system uses vast amounts of water, which means that valuable solid parts are difficult to utilise and the water is wasted. In a similar way, most of the waste is burned for energy use in many modern waste management systems although much of it could have been reused directly. The Nairobi Region has the opportunity to leapfrog to a sewage system that consumes a very low amount of water and introduce an overall waste management system built according to the following prioritised principles:
1. Reduction of waste and sewage volumes
2. Reuse of products and sewage (to prolong the life of the products and water)
3. Use of waste and sewage (solid parts) for energy production
4. Establishment of landfills with biogas extraction

Low-water sewage systems
Instead of introducing waterborne sewage systems, small-scale sewage systems leading into locally placed septic tanks should be implemented in many areas. This system has a much lower water use per capita and the solid waste can be collected and used for energy purposes without the need of expensive water and solid waste separation. Both wastewater and solid waste are unique resources for producing energy in the form of biogas or in the future bio fuels. At the same time septic tanks are more flexible then creating a comprehensive sewer systems all over the region.

Water supply
Water is a key to sustainable future development. Water is a resource that needs to be in strong focus, as intelligent water management will be a factor that determines how much the region can grow in terms of inhabitants just as it is a determining factor in agricultural production. New innovative approaches to water management must be introduced.
Energy
Energy supply is closely connected to the economic development of the Nairobi Metropolitan Area as indicated above.

Waste
Waste management is a present challenge but, at the same time, it does hold a lot of possibilities. The focus must be on reducing and reusing waste in energy production to the highest extent possible so that unnecessary waste dumps and the environmental impacts, transpors etc. connected to these can be avoided. For instance, reducing waste is connected to local food production and is a question of “classifying” reusable elements and local composting. The reuse of waste to energy technologies is based on either burning the remaining waste or turning remaining organic waste (e.g. from butcheries) into biogas.

GREEN NAIROBI
The landscape and wildlife in the region are unique in a global context and need to be protected, expanded and developed at the same time as the potentials in terms of urban planning should be utilised. Smaller and bigger forests, the many rivers, large coffee- and tea plantations, the diverse shambas areas and the simple beauty of the plains with scattered trees constitutes in line with the absolutely unique Nairobi National Park an abundance of attractive location potentials.

The concept of Green Nairobi has already shown great results, and it defines a path for the further development of the region as a whole, and we suggest to integrate the planning and development of landscape qualities, as a backbone in future development and planning at both regional, municipal and local level.

Rivers
The Rivers of Nairobi have been the basis of the development potentials in the region giving the name to the city as the “place of cool waters” and creating a fertile region with a great agricultural potential.

As water is becoming an increasingly scarce resource because of the growth in population, climate change and pollution, the rivers and the maximum use of the water in these become the key to a sustainable development of the region. The rivers are very dynamic in the sense that water levels change from periods where areas are flooded to periods when some rivers are drying out. In our proposal the rivers constitute the backbone of a comprehensive green structure for the Nairobi region. By creating a new attractive green structure connected to the rivers, by establishing new sewers for existing and future developments and introducing bicycle lanes along the rivers, these are turned into attractive points of orientation in the city, creating more then 150 km of attractive riverfront developments in core Nairobi.

The Nairobi River Bassin Project is the first important step in the conversion of the rivers of Nairobi into attractive areas of orientation in the urban structure rather
then sewers that the city turns its back to. To speed up this process, additional aspects need to be integrated, where the financial potentials of the potentially no less than 150 km of attractive riverfront developments need to be recognized. Steps need to be taken to ensure an integrated approach, where parts of the generated economic value of land close to the rivers can continue to fund further regeneration of the river areas. The green corridors along the rivers of the region could play other significant roles as areas where storm water can be retained and restored for utilisation in drought periods. Forestry and the current challenge of deforestation is important to address.

The goal in Nairobi Metro 2030 is to increase the forest cover in the region to 30% by which would mean planting of a lot of trees and stopping the process of deforestation in the Olkejaido province in particular. To achieve this more attractive alternatives to charcoal for cooking must be created and cost of electricity kept at a level where the poorer parts of the population can afford it.

A sustainable forestry sector is of great importance in creating a sustainable region, as forests and the provision of wood are essential in different ways. Forests have a positive impact on the climate as they absorb CO2 and forestry in urban areas can create a local reduction in temperature of 1.5 degrees. Wood is a sustainable building material if it is produced in a continuous and sustainable way with replanting, and, in the near future, it will hopefully be a necessary resource for cooking until electricity supply is cheap and sufficient.

**Benefits of Urban and Peri-urban Forestry (UPF) for the Urban Population**

While human societies have largely been rural over the years, currently the majority of the world’s population lives in cities and towns. Still more land is needed for urban areas to cater for the inputs and outputs (the urban footprint), with often a detrimental effect on forests and other green areas.

Especially in the developing world, where most (emerging) megacities are located, managing urban populations will be one of the main challenges of our time. What was once called a global village is turning into an urban globe. Urban migration was often the only chance of a better life, causing poverty to become an urban problem. Challenges related to urbanisation are very significant, especially in the developing world. Basic concerns such as the provision of food and housing, sanitation, employment and such are mostly still to be addressed.

The concept of urban and periurban forestry (UPF) offers important lessons and emphasizes the need to join forces with urban agriculture and other initiatives aimed at sustainable urban development. This requires a strategic approach and linkages need to be made to a broad range of issues and agendas. The problems faced by cities in the 21st century cannot be effectively resolved without a coherent alliance of all forces at local and international levels. Initiatives for cooperation and city-twinning open the door to various kinds of partnerships.
When existing good practices are built upon, Urban and Peri-urban Forestry (UPF) has shown significant contributions to the quality of urban life and the environment, together with other types of comprehensive green-space planning and management concepts. Through agroforestry systems, for example, UPF and urban agriculture join forces in supporting livelihoods. UPF has developed in response to the call for innovative, comprehensive concepts that promote the multiple benefits of urban green space. The concept encompasses the planning and management of forests and other tree resources in and close to urban areas and thus integrates different parts of urban green structures.

Urban Forestry for Multifunctional Urban Land Use

World-wide urbanisation brings with it a wide range of challenges. The demand for land increases, and the energy, resource, water and waste disposal needs of urban populations need to be met. Policymakers are facing tremendous pressures to develop city management strategies that strive for sustainable cities where all inhabitants can enjoy at least a fair quality of life and a reasonably healthy environment.

In the quest for healthy, liveable and sustainable cities, urban green spaces with trees as a major component play an important role. Urban forest can help improve livelihoods, temper harsh urban climates, conserve biodiversity and contribute to better human health.

Challenges related to urbanisation are very significant. Basic concerns such as the provision of food, housing, sanitation and employment have highest priority and are still to be addressed, especially in the developing countries. Urban green space therefore will only be given political priority if it can be used to meet these major urban challenges. Past experience has shown that urban green spaces form more than just a “supplementary” urban infrastructure and can even help provide livelihoods. The goods and services provided by forests and trees in or close to urban centres can be grouped into three main value-based categories.

Economic and Livelihood Values of Urban Green

Poverty alleviation and food security are high on the agenda of many international institutions and development aid programmes. With half of the world’s population living in cities and towns, urban agriculture plays an important role in this respect. Many countries have a long tradition of urban dwellers supplementing their diet and/or economy with local agricultural produce.

Establishing woodlots in villages and close to urban centres relieves the pressure on natural forests for fuelwood, poles and fodder. Urban forests can enhance urban agricultural production, primarily in agroforestry systems. Growing trees in combination with other crops or with keeping animals adds value through enhancement of microclimate and other growing conditions and diversification of produce, for example.

Timber and other wood products can be very important in urban areas, since large parts of the urban population of e.g. Africa, are still heavily dependent upon fuelwood. Forests and trees also provide non-wood forest products such as mushrooms, berries, (medicinal) herbs,
rattan, seeds, leaves etc. The generally positive impact of nearby well-managed forests, green areas and trees on real estate prices and business development has been documented during recent years.

Environmental and Ecological Values of Urban Green
Many of the environmental services provided by urban green space are characterized as climatic or engineering benefits, offering a “green infrastructure” to cities and towns. Of particular importance is the role of forest resources in water management. Many of the world’s largest cities rely on fully or partially protected forests in nearby or more remote catchment areas for much of their drinking water. Additional protective measures are often needed to ensure high quality drinking water from these watersheds.

In arid regions, forest shelterbelts around cities help combat desertification. Trees reduce storm water runoff and can assist with processing wastewater. Urban green also protects soils and moderates harsh urban climates, for example, by cooling the air, reducing wind speeds and giving shade. Trees and other vegetation intercept particles and gaseous pollutants and thus help reduce air pollution. Moreover, forests and trees in cities act as carbon sinks in the equations relevant within the context of global warming. The level of biodiversity of urban green areas is often surprisingly high, representing nature and the “wild” close to where people live.

Social and Cultural Values of Urban Green
The recreational values of forests, parks, gardens, and other urban green areas are especially well documented in the Western world. The large majority of all recreational use of forests takes place in areas not more than 1-2 km from people’s homes. The aesthetic values of trees and green have been known for centuries; urban green space makes for better, more attractive cities. Urban green can have a positive impact on people’s physical and mental health by providing settings for physical exercise, reducing ultraviolet radiation and air pollution, and lowering stress levels. By being actively involved in tree planting and management, local communities can be strengthened and crime rates can be reduced. In many developing countries, trees often have cultural and spiritual values that could assist new urban dwellers in finding their place in cities and towns. Today’s green spaces and the way they are used and managed can thus have strong historical roots.

CREATING NEW JOBS
A key question in transforming the Nairobi economy, is what people are going to live from, and what kind of new working places can be developed? A lot of relevant and realistic segments are pointed out in the Vision 2030, and on top of this the whole transformation process that are going to take place in the region, must me considered a very important element in creating new jobs.

Tourism
Tourism is the sector that has the most significant
immediate potential. The Nairobi Region comprises two National Parks and is the natural starting point for visiting a lot of other National Parks and unique environments – both in terms of nature and the local Kenyan lifestyle as it is practiced in different parts of the region based on local traditions and culture anchored in different tribes and communities. To achieve the full potential of this sector, National Parks need to be protected, expanded and developed to ensure an authentic experience for the tourists, and improved conditions for the wildlife, just as new niches should be developed on the basis of the local opportunities available.

Finance
The financial sector is another obvious sector of huge potential. As soon as trust in the ambitions of the Kenyan Government and the Ministry of Metropolitan Development has been established and inflation is kept at a moderate level, the basis for creating a market for long-term loans can be established. The possibility of getting long-term loans of 10, 20 or 30 years of payment would increase the opportunity of many Kenyans to invest in real estate and create a future for themselves where they can play a more active role in developments. "Microcredit programmes" could play an important role as well in terms of supporting small entrepreneurs.

Guidelines for establishing a centre of regional and global financial services must be integrated in the plan.

Sustainable energy
The green energy sector that is supportive of sustainable developments and the brand that the Nairobi Region strives to achieve is another important sector where Nairobi can play an important role in what has been called The Clean Energy Revolution. The Nairobi Region has a very positive starting point as hydro-power, geothermal energy as well as wind power have already been explored to an extent where 60 % of all electricity in the Region is based on water turbines. As water is an increasingly unreliable source, it should be supplemented with primarily geothermal energy where the Hells Gate area in Rift Valley alone is estimated to have an annual potential of no less than 1000 MW/year. In the areas 200 km north of Nairobi, conditions are perfect for windmills and an estimated 300 MW should be produced here. Solar power is another sector of tremendous development and with a great potential in the region that will be an economically attractive supplement both on a regional and very local scale when technologies are optimised within 5-10 years. A lot of foreign investors are already ready to dig into this big potential but focus must be on making fair deals with them so that the cost of electricity can be reduced to a level affordable to the poor part of the population. This would mean that they would not have to use charcoal for cooking, which is currently one of the biggest polluters and threats in terms of deforestation.

Construction
The building industry would be able to employ a large percentage of the population in itself when the need of 150,000 housing units at an annual basis is to be met –
both in the creative sector of architects and planners, in the production of building materials, in the construction sector as well as in connection with the wide range of innovations that have to be developed in order to make intelligent solutions minimising the use of water and maximising waste to energy technologies. This sector has to be very diverse and include both high-class developments aimed at tourists and the upper class as well as the growing middleclass and the poorest part of the population where focus should be on creating new housing opportunities so people can take part in building their homes themselves.

**Agriculture**
Agricultural innovation is another large sector that could contribute to sustain the strong position of the region just as new crops could create more value and secure an adaptation to the climate changes that will occur. The NMR is - and must be- able to provide for itself to ensure a sustainable development. This calls for innovation and more effective modes of production, agro-

"**Water supply is a key to sustainable future development. Water is a resource that needs to be in strong focus, as intelligent water management will be a factor that determines how much the region can grow...**"
MOBILITY AND ACCESSIBILITY

Transport forms a key component of creating a competitive business environment as well as means through which various social and environmental objectives will be achieved.

Efficiency in mobility goes hand and in hand with mitigation strategies to avoid further climate change as an efficient transportation system is by far also a climate friendly one. The possibilities of leapfrogging are great in the transportation sector as most cities in developed countries today suffer from poor city planning and an excess use of private transport with huge time losses as a result.

Today, more than 50 % of the people in Nairobi walk and less than 15 % use a private car, which is an excellent basis for a world-class transport system. We recommend that Nairobi, which aims at becoming a world-class city, should jump directly into the future by introducing an electrical public transport system.
An efficient and climate-friendly transport system should be based on two main principles:

- We aim to avoid unnecessary transport through integrated city planning, which will point at principles of densification and self-sustaining mixed use urban areas.
- The future developments will be planned according to the principles of Transit Oriented Development (TOD) where accessibility by means of public transport is a key parameter in urban planning and where focus is on higher densities in highly accessible areas.

As the future will be based on renewable energy sources, the common interaction system will be electrically based. Naturally, this is to avoid and/or reduce the consumption (and import) of fossil fuels such as coal, oil and gas.

Having this preamble, the overall transport system should be converted from a fossil-based transport system to one based on electricity such as metros, light rails, electrical vehicles etc. In the plan we propose to introduce a new mass rapid transit system connecting the peripheral areas in the Metropolitan area, as well as trams to provide internal accessibility inside the urban areas.

In some metropolises like New York, Paris, London etc., these systems have been established at an early stage but an increasing number of world-class metropolises are now introducing these high-class public transport systems. Lately, Dubai has introduced electrical public transport and a lot of cities are following this path.

Bicycles should be a much more common means of transport in cities. In major cities in Europe such as Paris, Amsterdam and Copenhagen, public bikes have been reintroduced and the number is increasing due to special bicycle lanes. This means that bikes constitute a still growing part of public transport in cities. In a climate such as Nairobi, it is obvious that bikes could play a much higher role if the proper infrastructure was in place. Bike lanes could very well follow the green structures in the city providing a safe and clean biking environment. We suggest to introduce bicycle lanes along all major roads, in green areas and along the rivers, as they are gradually transformed into recreative areas.

Electrical cars can be convenient for short distance transport in the future as well but the undesirable effect of private cars in terms of congestion and unattractive urban environments should be taken into account.

Park & Ride facilities including large car parks adjacent to new stations are important to stimulate the use of public transport and once a fast and effective alternative to private cars has been established, road pricing can be considered.
The future developments will be planned according to the principles of Transit Oriented Development (TOD) where accessibility by means of public transport is a key parameter...

A large part of the very pleasant climate in Nairobi can be attributed to the fact that the city is situated around 1800 m above sea level. This lowers the average temperature and creates an area where the rainfall is relatively higher than in the surroundings.

The Greater Metropolitan Area of Nairobi is subdivided into a number of municipalities and counties. These entities will have a large degree of self-governance, but will all adhere to the overall regional plan. Each will be given development potential, even with a centralized densification strategy.
The overall character of land use determines where it is desirable to establish new city growth. It is more efficient to keep farm land open and productive than to subdivide plots and gradually transform it into city. The city developments are better located on less fertile land, as long as it is not too hot.

The rivers in the area are vital to the life in the area. They are used both for drinking, hygiene, irrigation and livestock. During periods of normal rainfall, the majority of power in the region is created from dams in the North. Many of the rivers are today polluted and used for dump sites.

The tendency in the regional development is that people mainly live to the North and East in the farm land. This tendency shows that the climate and general conditions is optimal here for the “shambas” typology, where a plot of land creates subsistence for the family living on it.
1. **Creation of an extended and coherent core Nairobi, based on the principle of creating self sustained mixed use urban areas to reduce the need of transport.** Existing urban areas in Juja, Ruiru and Thika, are incorporated in this structure, and are going to be developed on the same principles of maximising self sufficiency in terms of public service, workplaces, and attractive housing areas.

2. **Creation of an effective regional infrastructure to ensure easy and effective relations between new and existing urban areas.** Core Nairobi (extended) is connected by a new mass rapid transit system that should be coordinated with the ongoing renovation of the railways. At the same time a lightrail system is proposed in connection to radial connections along the main roads in Nairobi connecting to stations on the ring road where natural new urban centres can be created to promote a transit oriented development. In the long run these can be extend to Kangundo and the new Super Modern City, like a new railway to Tanzania via Namange can support radial developments here.

3. **Location of new urban areas in the climatic zones that reduces the need of heating and cooling, and at the same time in areas that are not high value agricultural areas.** Athi River defines a regional limit for the dense urban areas, to create a clear and understandable principle.

4. **Creation of a green structure based on the location of rivers, to protect the river areas and create attractive orientation for future developments.** The green structure applies to both the regional level, ensuring migration corridors, on the municipal level to ensure public space and recreation, and at local level, where the green structure is used for orientation of new settlements.

5. **Expansion of the Nairobi National park to expand the potential of tourism and attractive locations.** The Nairobi National Park has a huge potential in terms of tourism, hotels etc. and an attractive location for new residential areas. To optimise the potentials of the National Park, the park is expanded to four times the existing area, improving conditions for the wildlife and increasing the tourism potentials enormously. By expanding the Nairobi National Park more than 100 km of attractive "National Park frontage" new real estate possibilities are created – investment potentials second to none.
The climate has been a determining factor for the development concept. In terms of sustainable development, the whole world should live in Nairobi, as costs and energy use for heating and cooling are minimal compared to any other place on earth. The climate has been a determining design component in our proposal, where we propose to concentrate the future development in the region around core Nairobi where the temperature is most attractive.
In order to ensure a sustainable city growth in the region, it is important to improve the public transport system. The future centres for urban densification will naturally be connected to the infrastructural key points. The key to decongesting Nairobi will be to establish a peripheral ring of rail and road, thereby short-circuiting between the radial movement corridors and leading the traffic away from Core Nairobi.

The stretch of rail from Athi River to Thika is already being re-established. There is a need to re-establish the rail all the way to Mombasa. We also propose a new rail connection towards Tanzania in the South.

The rivers in the area have a great potential, both in terms of serving as life-giving natural focal points of developments, but also as recreational areas that contribute to the quality of life in the region.

Another potential of the rivers will be that they can serve as natural barriers for urban growth.

A large part of the challenge of enabling the rivers to play the key role in the future plan that we see as necessary will be to clean them from the current pollution and over-exploitation in areas.

The main development concept of the region should be T.O.D (Transit Oriented Development). This will naturally define radial development directions both towards the North, South and East. The rail ring around Nairobi will be another natural focal area for urban developments. The new towns that will be placed here like beads on a chain will serve as the centers for the surrounding agriculture in terms of marketplaces and agroprocessing.

It is important for the future developments to be focused and of a certain density so that all inhabitants of these new settlements are close to public transport.
As the only city in the world, Nairobi has The Nairobi National Park right next to it.

Nairobi is placed within reach of some of the most spectacular nature experiences in the world, yet not all of it requires hours or days in a jeep to experience. As the only city in the world, Nairobi has The Nairobi National Park right next to it. Today it is almost like a zoo, as the size is almost too small to serve as natural habitat. The future National Park will be increased to more than triple size and create better conditions for the wildlife and at the same size creating a large increase in the valuable land with frontage towards the park.

An overall analysis of the regional land use reveals very distinct land types and potentials to be addressed in the future plan. To the North it is mainly the potential of agriculture that determines that there should not be intense city development here. To the south, there is a need to preserve the natural habitat of the wildlife as well as not interfering with the Masaai people and their traditional lifestyle. To the South West we see the greatest potential for afforestation in a large coherent area. This will also be done on a local scale inside the city rail ring.
Because of the lack of updated maps of the existing developments, as many are informal, we decided at an early stage of the competition, to base our work on Google Earth, where it is possible to draw and register existing and proposed landuses directly on the detailed ortho photo.

In the first phase we registered the major development trends and landscape character areas like forests, large agricultural areas, shambas areas, plains, national parks and dense urban developments and villages etc. We decided that high value agricultural land must be protected to ensure local food supply and that rivers must be a very important structural element as both a lot of existing problems and future potentials are connected to these.

The main roads and rail lines and projected infrastructural works were analysed to be able to optimise the integration of existing and future infrastructural facilities.

Clear borders in the existing urban structure like rivers and roads are used to define clear urban growth borders that are easily comprehensible and manageable. Our analyses on the climate showed us, that development in the areas east of the Athi River would be less favourable.

1. Registration of Existing Developments

Our approach is pragmatic in the sense that we as a principle recognize all existing developments as being legal and use existing developments as an indicator of where people want to live.

Other factors effect the proposed areas to be developed as well:
- Proximity to attractive landscape qualities, not least the Nairobi National Park, and rivers that serve as attractive points of orientation and recreational landscapes.
- Landprices are important as well, as well as larger areas of clear ownerships are to be preferred, to facilitate implementation.
2. Delineation of an Urban Growth Boundary (UGB)

On the basis of existing developments and areas that have an attractive potential for urban development in terms of proximity to attractive landscape elements like the national park, rivers, large coffee estates etc., we propose an urban growth boundary.

The location of the urban growth boundary (UGB) is based on different parameters that differ from one area to another:
- The majority of existing developments must be encompassed within the UGB, which is pointed out for further densification. Exceptions from this principle are settlements too close to the rivers or directly on the riverbanks prone to flooding.
- Where possible the delineation is located in some distance to existing developments, so that new infrastructure and urban developments taking advantage of the attractive location can be developed, creating a harmonious and precise border between urban and rural areas.
- The Nairobi National Park has a potential for a unique location of both hotels and residential areas, so here we fold the UGB to maximise the length of the National Park frontage.
- Existing ownerships and land use patterns are used as logical borders for the delineation, so that existing use can continue, and the fewest possible landowners have to be included in the transformation process.
- Areas that are to a large extent not yet developed, with few owners and low land prices, are included as well to be able to provide housing for the poorer part of the population.

"A substantial amount of the planning work in the region will be to make a detailed range of thematic maps."
3. Registration of existing roads

Identification of roads that are most suitable for being upgraded to municipal standards to ensure future mobility, and connections to the primary roads of the region. These roads are combined with new roads giving access to developments connected to the attractive surrounding landscapes of the urban areas.

On the regional roads the road layouts are generally wide enough for expansion, whereas some areas have been developing solely on the basis of dirt roads with no consideration for neither internal or external connectivity. In these areas expropriation of land and in some places houses can be the best solution, or new roads can be placed on the UGB.

4. Registration and Establishment of an Internal Green Structure in the Urban Areas.

Crossing rivers and other low lying areas prone to flooding are defined as part of an internal recreational structure in the urban areas. They serve a number of purposes, and where no given natural low lying areas exist they can be introduced more freely on the basis of the local topography. The areas must be bought up by the local municipalities at an early stage of the development, which would have a lot of positive effects and possibilities.
- They serve as important nodes of orientation for future developments
- Through public ownership it can be ensured that areas prone to flooding are not developed, and they can be designed so that they can contain water during heavy rains (El Nino), and water can be lead to the surrounding rivers.
- They can be considered as programmatic zones where future public institutions like schools, libraries, museums, high schools, markets etc. can be located on cheaply acquired land, with the objective of securing public service in the future.
- The areas have a great recreational potential, and by combining them with bicycle lanes a very attractive alternative to cars can be created.
Creating new attractive orientations in the region.
NEW CITY TOWARDS TEA PLANTATION

GOLF COURSE DWELLINGS

NEW FOREST IN THE CENTRE OF EXTENDED CORE

TOURIST VILLAGE TOWARDS GAME PARK

SOLAR CELL SCIENCE PARK

TOURIST HOTEL IN THE NATIONAL PARK
1 km

new by-pass road from competition material

new by-pass road from KNHA material

ew new by-pass road uncertain?

Rehabilitated rail

Project proposed road/rail

existing road from competition material

existing main road from competition material

INFRASTRUCTURE MAP OF EXTENDED CORE

Light rail Line 1

Light rail Line 2

Light rail Line 3

Inner circle ring

Peripheral rail ring

CBD

Light rail Line 2

Light rail Line 3

Spatial Planning Concept for the Nairobi Metropolitan Region

VNMONm405020876
The first phase of development of the extended core should focus on establishing the radial light rail lines servicing the existing city. New developments should happen along the road to Thika and in the South around Athi River.

The second phase of the peripheral rail line will connect between Thika and all the way to Athi River. This will enable an accelerated growth of the 3 new towns along this stretch.

The last stretch of rail around the National Park could with great potential be constructed as early as possible, as this will create very attractive locations for growth.
The satellite towns on the new peripheral ring are placed in relation to existing municipal borders as far as possible.

Some towns are however divided by two different municipal borders. In these instances, it would be natural to make the division between these along a road or another natural border.

In the long term, it would even be possible for the most developed of these satellite towns to become their own self-governing municipal entities.

Looking at the range of new urban centres, these will have different characters and densities according to their placement in relation to either new or existing developments. The programmes illustrated above should be seen as samples of programmatic composition, as this is something that will need to be further developed alongside the overall plan.

These new centres will have a varying number of sub-centres in relation to them. These sub-centres will also vary in character, but all should have a range of basic necessities including street lighting, school facilities and markets.

In the existing city, not all sub-centres will have sewers, but all will at least have septic tanks.

Core Nairobi has a special strategic significance. In addition to this, the location of Athi River, Thika and Gitaru in relation to the national infrastructure makes them special focal points.
FOCUSING URBAN GROWTH
(in millions)

<table>
<thead>
<tr>
<th>Area</th>
<th>Growth 2007-2030</th>
<th>Avg. new density (people/km²) 2030</th>
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</thead>
<tbody>
<tr>
<td>Core Nairobi</td>
<td>2.94</td>
<td>6.65</td>
</tr>
<tr>
<td>Northern Metro</td>
<td>1.66</td>
<td>2.79</td>
</tr>
<tr>
<td>Southern Metro</td>
<td>0.55</td>
<td>1.39</td>
</tr>
<tr>
<td>Eastern Metro</td>
<td>1.06</td>
<td>1.71</td>
</tr>
</tbody>
</table>

Urban population growth in new plan (2007/2030)
(50% of N-S-E growth focused in Extended Core. Rest in local urban centers.)

<table>
<thead>
<tr>
<th>Area</th>
<th>Growth 2007-2030</th>
<th>Avg. new density (people/km²) 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended Core Nairobi</td>
<td>2.94</td>
<td>7.99</td>
</tr>
<tr>
<td>North (Limuru)</td>
<td>1.66</td>
<td>2.26</td>
</tr>
<tr>
<td>South (Kajiado)</td>
<td>0.55</td>
<td>0.97</td>
</tr>
<tr>
<td>East (Machakos)</td>
<td>1.06</td>
<td>1.38</td>
</tr>
</tbody>
</table>

Extended Core Nairobi:

- 850 km²

FUTURE DENSITY
Core Nairobi size today: 687 km
Avg. density (people/km²) 2007: 4300 ppl/km²
Densification potential: 20-50%
Resulting density (people/km²): 5200-6500 ppl/km²

Total reserved land in Extended Core for new urban areas: 850 km²
Growth 2007-2030: 5.65 million ppl.
Avg. annual growth: 250,000 ppl.
Avg. new density (people/km²) 2030: 6650 ppl/km²

Comparison of densities:

- Suburban: < 5,000/ km²
- Average urban: < 10,000/ km²
- Dense urban: > 30,000/ km²
- Kibera: > 200,000/ km²

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The 44km² new town prototype shown has its central urban heart where the proposed regional ring connection (proposed with a mass rapid transit system) and the already existing east-west main road (proposed with a light rail transit system connecting to the station in Juja) cross each other.

The urban heart of the new town is extremely well served by public transport as the green public strip with a light rail system that runs through all three quarters of the new town touches the central urban park at three points and connects to the central station. Hence, the central park becomes a vibrant urban space where people pass outdoor markets, cafés, shops, water features etc. The city centre is subdivided by three green wedges that make a connection with the surrounding green landscape. Within the oval ring road around the approx. 2km² dense city centre, cars and pedestrians move through shared street spaces at low speed, allowing for an active city life with local public squares and a mixed use of apartments, offices, shops etc.

The city centre is most feasibly developed if the municipality buys the land that at present (according to aerial photographs) seems free of any particular developments.

The three urban quarters surrounding the city centre are envisioned as generic urban developments, taking as a starting point today’s already existing streets and settlements (shambas). Apart from the structuring streets, the only strictly defined element in the three urban quarters is the internal green public strip that serves as an important node of orientation for future developments and a programmatic zone for future public institutions such as schools, libraries, sport facilities, museums etc. Specific areas in the green strip should be designated for collecting water during heavy rains – which from here can be lead to the surrounding rivers.

Along this green public strip a light rail train system gives public access to all areas within the new town, including the city centre. The green strip helps in a logical way to organise different town areas. On the inside of the green strip, a program of mixed use but also space demanding industries related to building industry, manufacturing, wholesale etc. can be placed advantageously. On the outside of the green strip, overlooking the green river areas, housing developments will have a very attractive location.
NEW GREEN TOWN CENTRE WITH STATION AND MARKET PLACES

Spatial Planning Concept for the Nairobi Metropolitan Region
COMBINING LOCAL AND INTERNATIONAL LIFESTYLE
PUBLIC SPACE DESIGN CONCEPT

Our Public Space Design Concept is based on digging into the great potential of creating a coherent green structure in both the existing and new urban areas.

1. **Definition of Urban Growth Boundaries** defines a line of attractive locations towards the surrounding landscapes. The urban growth boundary is located so that existing developments are encapsuled, ensuring a distance to rivers and migration corridors.

2. **Introduction of new light rail / trams / busses** to provide increased accessibility internally in satellite towns and existing urban structure, to create increased accessibility by public transport, depending on local possibilities.

3. **Creation of coherent bicycle infrastructure** to create healthy and cheap transport possibilities.

4. **Cleaning up the rivers inside Nairobi** to create new nodes of orientation, and create attractive and active parks. By integrating the strategy of cleaning up the rivers with a strategy of introducing sewers along the rivers, many goals can be achieved at the same time.

5. **Integrate Urban agriculture and Urban Forestry** to create underline the image of Green Nairobi as a fertile city. At the same time this creates increased food security and new jobs in the region, based on local skills and traditions.

6. In redevelopment plans and plans for new urban areas, always remember to think of the possibilities of creating and expanding the green structure in the city. This green structure creates the possibility of attractive orientation and thus the possibility of both a more dens urban development and introduction of bicycleroutes.

7. **Renew slum areas by introducing new open and green structure both internally and along the rivers.** This creates the possibility of introducing new public facilities as toilets, electricity, sewers waterstations, healthclinics etc, and promotes an orientation towards the rivers where bicycle paths along the rivers can create attractive commuterroutes, and promote trade and interaction.

8. **Develop new types of low cost housing based on renewable local materials.** Both the cost of transport and the building materials used for conventional housing makes them to expensive to create the amount of houses needed to support the gigantic need of low cost housing.

9. **Create building typologies that consider the aspect of security** by defining clear borders between public and private areas.
NEW URBAN RIVERFRONT NEAR EASTLEIGH AIRPORT SITE
NEW TOWN: EASTLEIGH AIRPORT

We propose to relocate the present Eastleigh Airport, as the area it occupies today holds great potential for a future urban development in the central part of Nairobi. For example a new Financial District.

We envision the area around the existing runway as the future green spine in the new development. Along this urban park a first step in the development can take place, as the area at present is free of any existing buildings and therefore easily accessible.

A light rail system is proposed, connecting Kangundo Road through the urban park with the Central Station of Nairobi, thereby giving exceptional public transport access to the whole area.

At both ends of the transformed runway the park connects to the Nairobi River area. In between these two points the river bends southwards and away from the park, creating high potential for renewal of existing slum areas next to the future green revitalized riverfront.
THE FORMER RUNWAY OF THE EASTLEIGH AIRPORT BECOMES A GREEN PARK
The first step of a revitalization strategy for Core Nairobi is to identify existing green areas within the city, both formal and informal, in order to establish a skeletal framework of green node points, from which we can expand and develop a series of green corridors across the city.

The rivers in Nairobi are today polluted and in need of re-establishing. There are however already programs that address these issues. We suggest that these programs continue and expand to include the introduction of sewer networks to prevent the re-introduction of effluent into the water course.

The re-establishment of river networks will also create a new orientation through the city, focusing new developments, green areas and connections as well as revitalization of run down areas.
Along the newly re-established rivers and streams, we propose to further develop the surrounding banks, expanding these natural arteries through the city into fully grown and thriving green corridors, weaving their way through the urban fabric and creating new connections and coherency between the existing green framework and areas where people can relax, congregate, take part in sporting activities as well as a series of small scale allotment farming initiatives.

Along these proposed green corridors we have identified several locations where new developments would flourish and help to bolster the revitalisation of the local area as well as the continues expansion of the green corridors.

A vital part of the new strategy for Nairobi will be to implement safe bike paths all over the city. These will have designated areas in relation to all major roads. Apart from this, bike paths with both a great recreational quality as well as commuting efficiency, will be built in relation to all the newly re-established rivers.

This new framework of bike paths together with the new light rail lines will drastically reduce the congestion problems on the roads in the area.
Renew slum areas by introducing new open and green structure both internally and along the rivers. This creates the possibility of introducing new public facilities as toilets, electricity, sewers waterstations, healthclinics etc, and promotes an orientation towards the rivers where bicycle paths along the rivers can create attractive commuterroutes, and promote trade and interaction.

Low cost housing
As a supplement to high class developments, a major challenge is to create low cost housing for the poorer part of the population, in the new urban areas laid out in the satellite towns. Sand bag houses are an example of low cost housing. They are easy to build and the idea is to let the inhabitants build their own house. Only a few instructions are needed.

The houses are very environmentally friendly as sand is a local material and does not need long-distance transportation. Also, only the bags need fabrication and this to a very limited extent of energy usage. In that way, the carbon dioxide emission of one square meter sandbag wall drops by more than 95% compared to a conventional brick wall.
PROMENADE ALONG THE RIVER IN KIBERA PROVIDE NEW ACCESSIBILITY AND LIFE
A Spatial Development Plan for the Nairobi Metropolitan Region will present a vision and a development strategy with a great impact on many people on a great scale in both time and space. Communication of the Spatial Development Plan and its principles to stakeholders will be crucial for a successful implementation. The Nairobi Metropolitan Region aims at using world class governance systems.

The Spatial Development Plan for the region can be communicated to citizens, administrators and municipalities using the KE-plan. The KE-plan is a web-based portal that can compile all information and maps regarding regional and local planning as well as sector plans and present it to an audience in a structured manner. The Portal can be customized to fit the Spatial Development Plan. The portal is using state of the art web technology and integrates GIS using open source standards (wfs/wms). Please note that these GIS formats can be published using the WebGIS Application. We propose the Spatial Development Plan to be incorporated into the KE-plan web portal.

The following text is a presentation of the KE-plan web portal and the structure and hierarchy of the planning system to be implemented. Moreover, the services provided as a part of the Spatial Planning Concept for the Nairobi Metropolitan Region will be presented. Finally we propose the use of KE-plan web portal for planning on the sub-regional level in municipalities and their sub-areas.

**Structures and Hierarchy of the Development Plan**

The principles of a planning hierarchy, e.g. a spatial development plan, is rigid meaning that the regional plan will determine the general structures and principles of any underlying spatial development plan. E.g. the development plan for a municipality must comply with the guidelines of the regional development plan. Likewise, the even more detailed development local plan must respect the structures and principles of the development plan on the municipality level.

Following this structure, the principles of the overall Spatial Development Plan and Spatial Planning concept for the Nairobi Metropolitan Region will be inherited on a local scale. Another benefit and strength of this rigid system is that all sector plans, e.g. land reservations for water supply, waste management, utilities, allotments, sports etc., will be respected by the planners on the sub-regional level.

**KE-plan - Democracy and Transparency in Focus**

Creating a web based spatial development plan of a region or municipality brings democracy and transparency into focus. The KE-plan is designed for the Internet and has the positive benefit that it generates a markedly increased citizen involvement. All available information in the spatial development plan can be made public, and GIS data on dynamic maps point out demarcations and restrictions.

**Always Updated Plan**

A major advantage of the KE-plan is that it is always
updated. A new version of the plan or updated maps or text can be published directly into the web portal keeping it fully up to date. This ensures that the stakeholders will easily find updates and only valid information. There is no need for a printed paper version of the Spatial Development Plan, as prints will be invalid as soon as one part of it is updated. The web portal does, however, offer print friendly pages of text and maps.

Easily Accessible Information
The dynamic dimension of a fully digital spatial development plan has the benefit that stakeholders will find it easier to get the information they need and easier to collate knowledge, which they consider important. On the web portal, stakeholders can navigate across plans and sectors at different spatial levels.

“What Applies to Me?”
The full integration of digital local maps and GIS data in the spatial development plan give great value. The digital map viewer offers an easy and quick spatial overview of information on several levels. By clicking on the map, stakeholders can easily verify the principles and guidelines, which the Spatial Development Plan imposes to a certain sub-area. This is possible due to the dynamic interaction between the maps and the text.

In relation to the Spatial Planning Concept for the Nairobi Metropolitan Region, the overall principles and guidelines for the Spatial Development Plan will be performed by the Ministry of Nairobi Metropolitan Development (MONMD). The MONMD principles and guidelines will apply for all municipalities and their sub-areas. Likewise, the MONMD will point out reservations of land for a variety of sectors e.g. water supply, waste management, utilities and national parks etc. These sector plans will be performed by the relevant ministries.
The individual potentials of the different parts of the region will play a large role in the next phase of creating a Regional Development plan. Shown here are some examples of local strategic opportunities that could be refined in the future urban development. In the Google Earth file attached on the cd you can explore our methodology in terms of delineation of UGB and new urban centres and development areas.
2. NAIROBI CENTRAL STATION

3. GITARU URBAN CENTRE

4. LIMURU URBAN CENTRE

5. NEW JUJA URBAN CENTRE

6. ATHI RIVER - THE GATE TO NAIROBI

7. KIAMBU NEW URBAN CENTRE