

atlas -

MOZAMBIQUE

MAPUTO METROPOLITAN AREA

a corridor TOWARDS SUSTAINABLE urban development”

complex cities -

Inclusive cities programme

**Master architecture,
urbanism and building
sciences**

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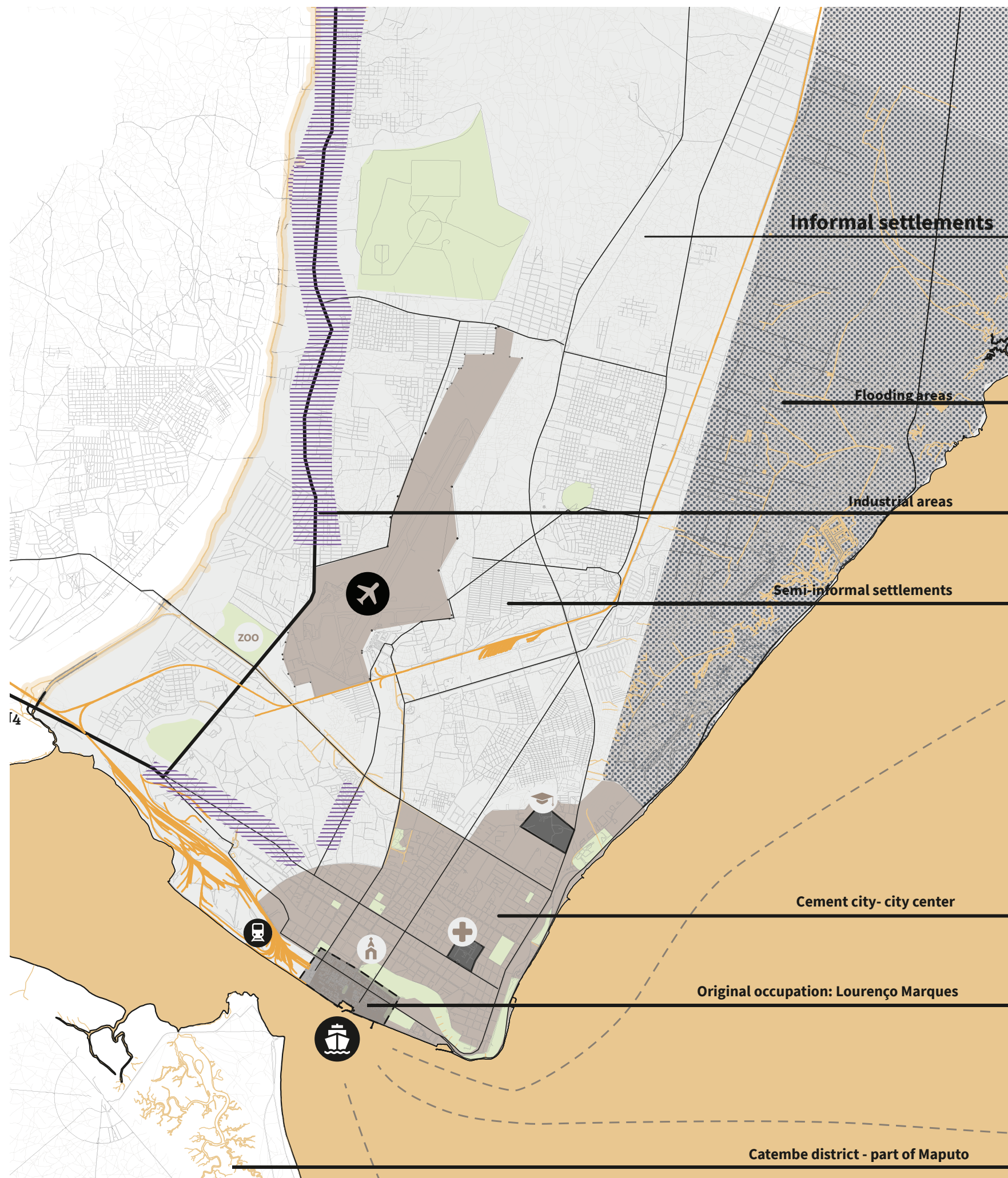
Urbanism Master thesis

Delft University of Technology, Netherlands

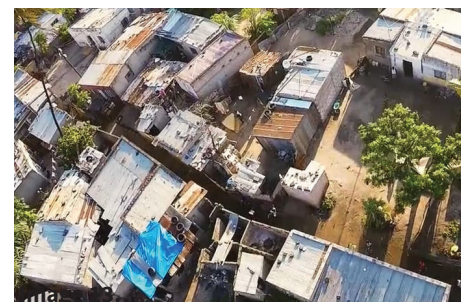
July 2018



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I14.



Image 15



I16.

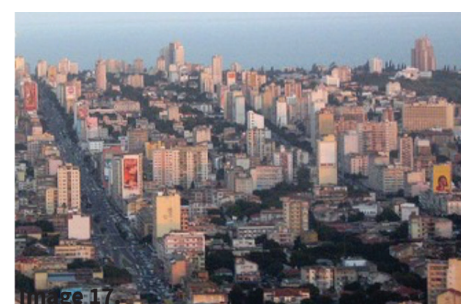


Image 17

LEYEND

- water bodies
- flooding areas
- urban area of Maputo city
- natural spaces
- airport extension
- city center
- industrial areas
- main roads
- railway

DESCRIPTION

Maputo is the capital city of Mozambique. Located in the South of the country, it frames the access of the Indian Ocean by the creation of the Maputo Bay, former Delagoa Bay. The city belongs to the southern province of the country, Maputo province, with a population of 1.638.631 people. The 70% of the province population lives in Maputo and the 30% in Matola. There are not other important communities in the province (INE 2010).

Maputo cidade has a population of 1.380.000 inhabitants in an area of 347 km², the city experience a population density of 3977 inhabitants/km² (INE 2010). There was a rapid urbanization trend between 1870 and 1975, however, the majority of the inhabitants were immigrants during the civil war between 1975 and 2002. Because of a lack of proper land management, specially during the civil war, the immigrants started to occupy the areas in the Northern part of the city and in between the industrial zones. The government adapted a “laissez-faire” policy, which lead to the current structure of the city where the majority of urban tissue is not properly planned on access to basic services. From that moment, there were several plans to improve the conditions of the informal areas of the city, which lead to the creation of semi-informal zones where there is a basic planning but the constructions are not properly adapted.

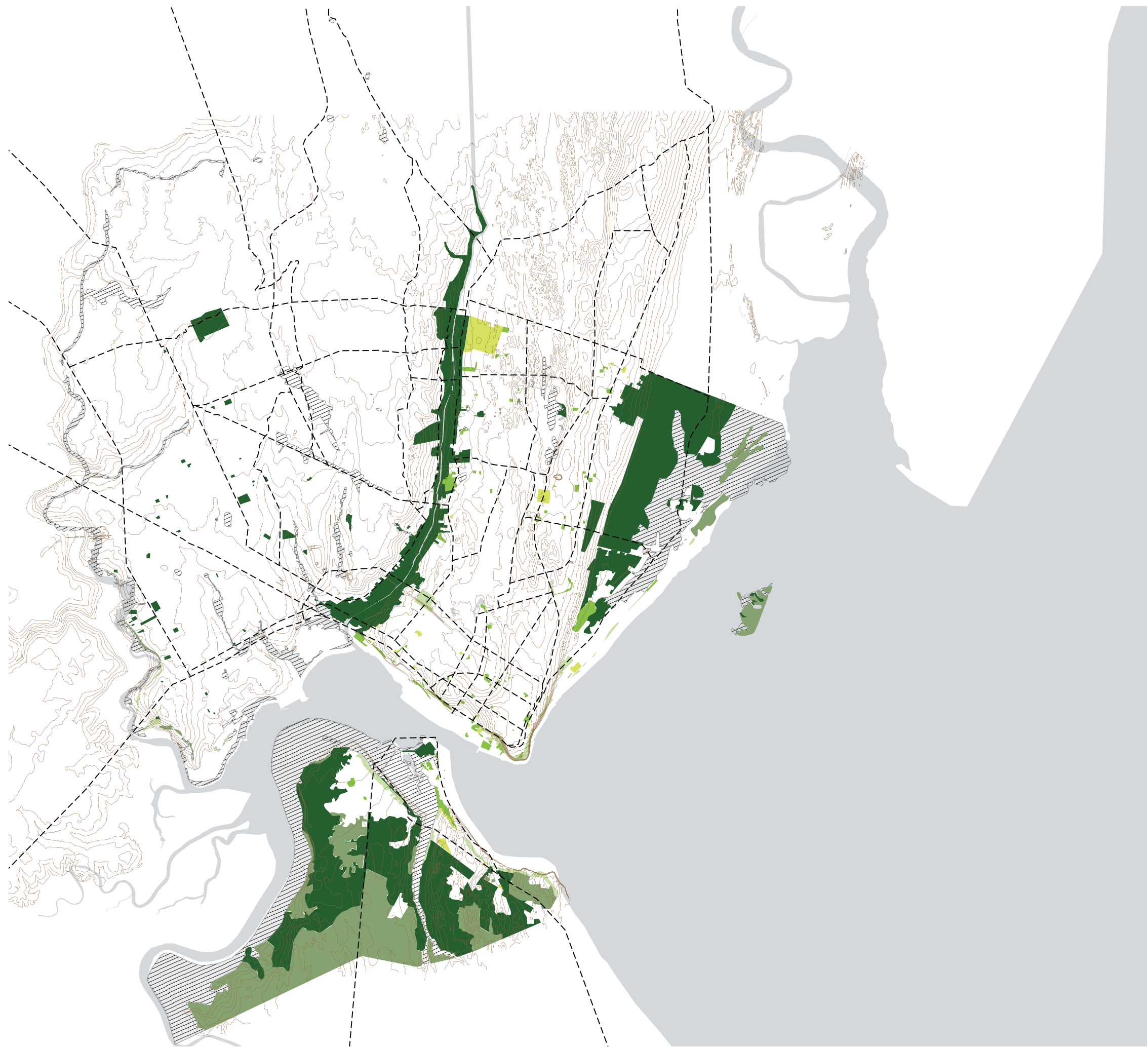
1

MAP OF CURRENT MAPUTO CITY.

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street maps interpreted and adapted by author.

References: Pacheco Melo, V. (2013) “Urbanismo português na cidade de Maputo: passado, presente e futuro” Brazilian Journal of Urban Management, 5(1), 71-88; Conselho Municipal de Maputo. (2011) “Requalificação Urbana”; Jenkins, P. (2000). City profile - Maputo. CITIES, 17(3), 207-218. doi:Doi 10.1016/S0264-2751(00)00002-0



LEYEND

Main roads

Protected natural spaces

Urban green parks and gardens

Natural green areas - bushes

Agro-pecuary areas

Flooding areas

Eventual flooding areas

Water

DESCRIPTION

The Maputo Metropolitan Areas is highly connected to its natural landscape. By its location of the Maputo bay, there is a high touristic population related to the beach resorts and attraction. At the same time, within the delta area and the river shores, there are natural reservations that needs to be preserved, not only from being flooding areas, but because of its natural richness. Also, within the city extensions, it is essential to highlight the topography. The city of Maputo was built over an scarped topography in the north-south edge. The topography descent towards the western Infulene river valley that separates Maputo cidade from Matola city (Jenkins 2000); (Pestana Barros 2014). There are several flooding areas specially in the east coast line because of the low topography lines. This resulted in several flooding problems during the development of the city, specially in the year 2000.

2

LAYER ANALYSIS.
LAYER 1-
NATURAL LANDSCAPE

Author: Concepción del Rocío Aranda Iglesias
Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)
References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

DESCRIPTION

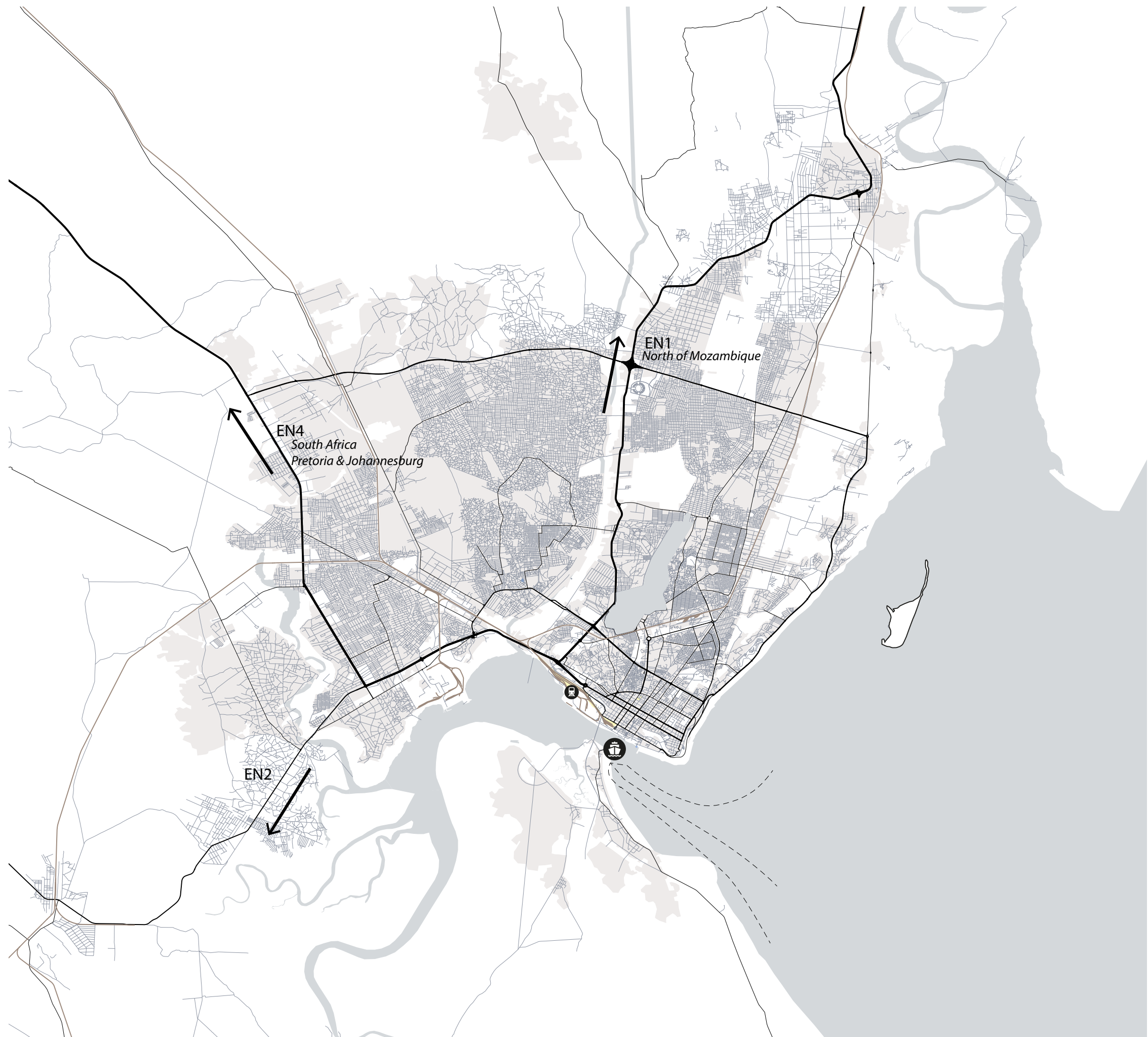
Maputo Metropolitan Area is constituted by the cities of Maputo and Matola, each one with its own districts and neighbourhoods. Maputo is divided in 7 districts, separated in three different spatial zones: the city of Maputo, the area of Katembe and the island of Inhaca. Matola is constituted in three districts: Matola, the city centre; Machava, industrial area; and Infulene, area born to locate the extension residential areas of Maputo, linked to the industry of Machava.

The districts of the cities are divided in smaller scale administrative areas, named 'bairros' (neighbourhoods). Maputo is divided in 56 neighbourhoods: 49 neighbourhoods within the city extension, apart from the area of the airport; 5 neighbourhood within the area of Katembe and one sole neighbourhood in the island extension. Matola is divided in 40 neighbourhoods: 14 neighbourhoods within the district of Matola, 11 within the area of Machava and the area of Infulene divided in 15 neighbourhoods.

3

**LAYER ANALYSIS.
LAYER 2-
GOVERNANCE**

Author: Concepción del Rocío Aranda Iglesias
Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)
References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

- Railway
- Current urban extension
- Bus
- Taxi
- Transport oriented areas
- Trunk - principal roads
- Primary roads
- Secondary roads
- Tertiary roads
- Residential
- Footway

DESCRIPTION

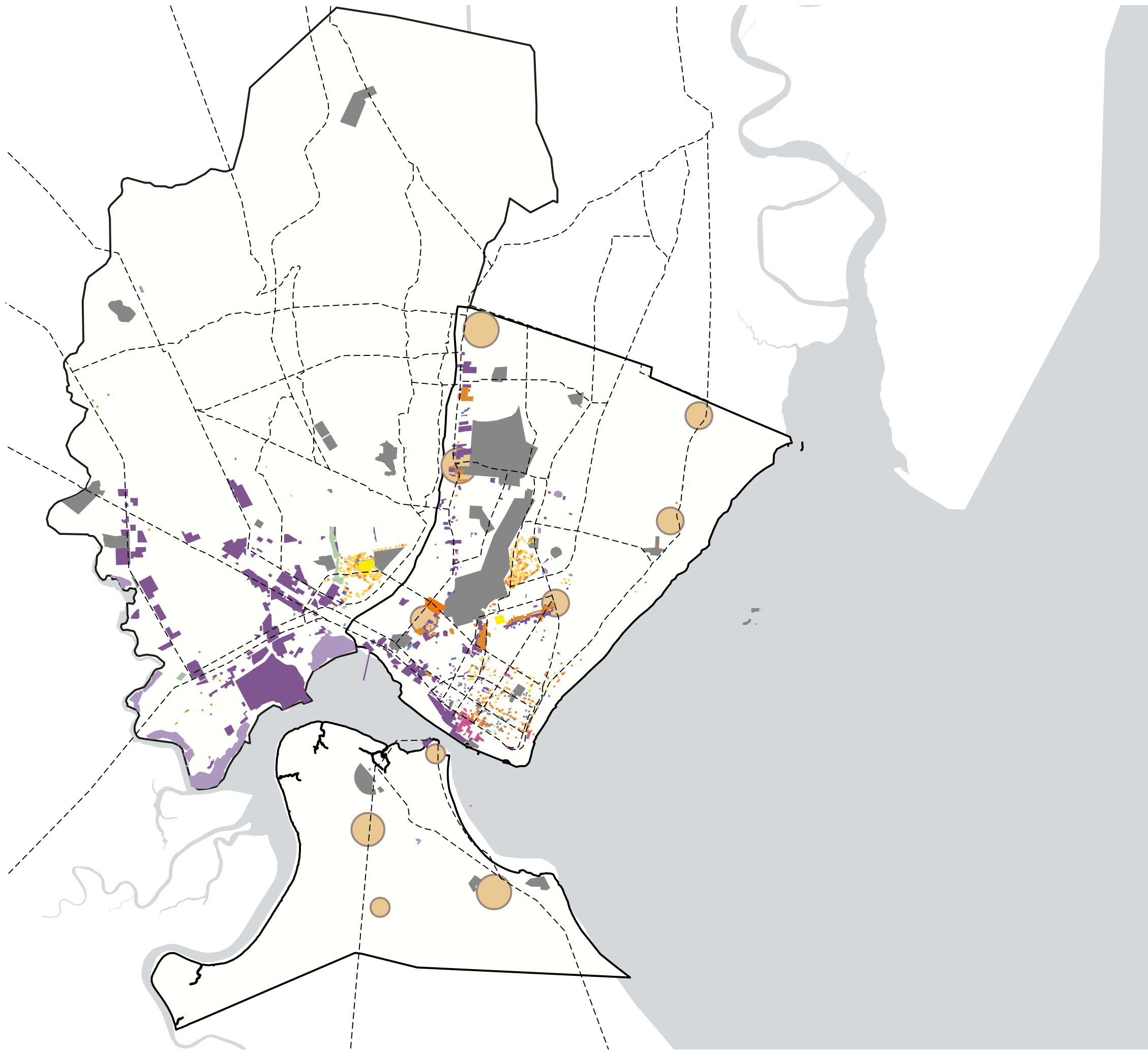
In terms of mobility, Maputo Metropolitan Area relies on a multi-layer connection with maritime, train and roads connection.

The most used ones are the roads, with a highlight of the EN4 that connects the are with the main cities of South Africa: Pretoria and Johannesburg and it is also named as Maputo Development Corridor. Main roads are also the EN1, main connection to the rest of Mozambique in the north and the EN2 that presents an access to Swaziland and the South of South Africa. The maritime port of Maputo and Matola is known as the closest water connection to Gauteng, the economical core of South Africa. This supposed historical relations between Mozambique and South Africa which are stablished nowadays. The maritime exchanges are supported by a railway infrastructure along the N4 and N1.

4

LAYER ANALYSIS.
LAYER 3-
MOBILITY

Author: Concepción del Rocío Aranda Iglesias
Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)
References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

- Main infrastructures
- Industry - extractive
- Industry - stock and maintenance
- Multifunctional areas
- Special uses areas
- Orchards
- Farmland
- Farmyard
- Administrative
- Shops
- Services
- Tourism
- Offices

DESCRIPTION

The main productive activities in the Maputo Metropolitan Area are focused on the agriculture and industrial sectors.

Because of its humidity, the agriculture sector is related to the water sources and the peripheral areas where the agriculture is the main source of food due to the lack of proper connections with the main cities.

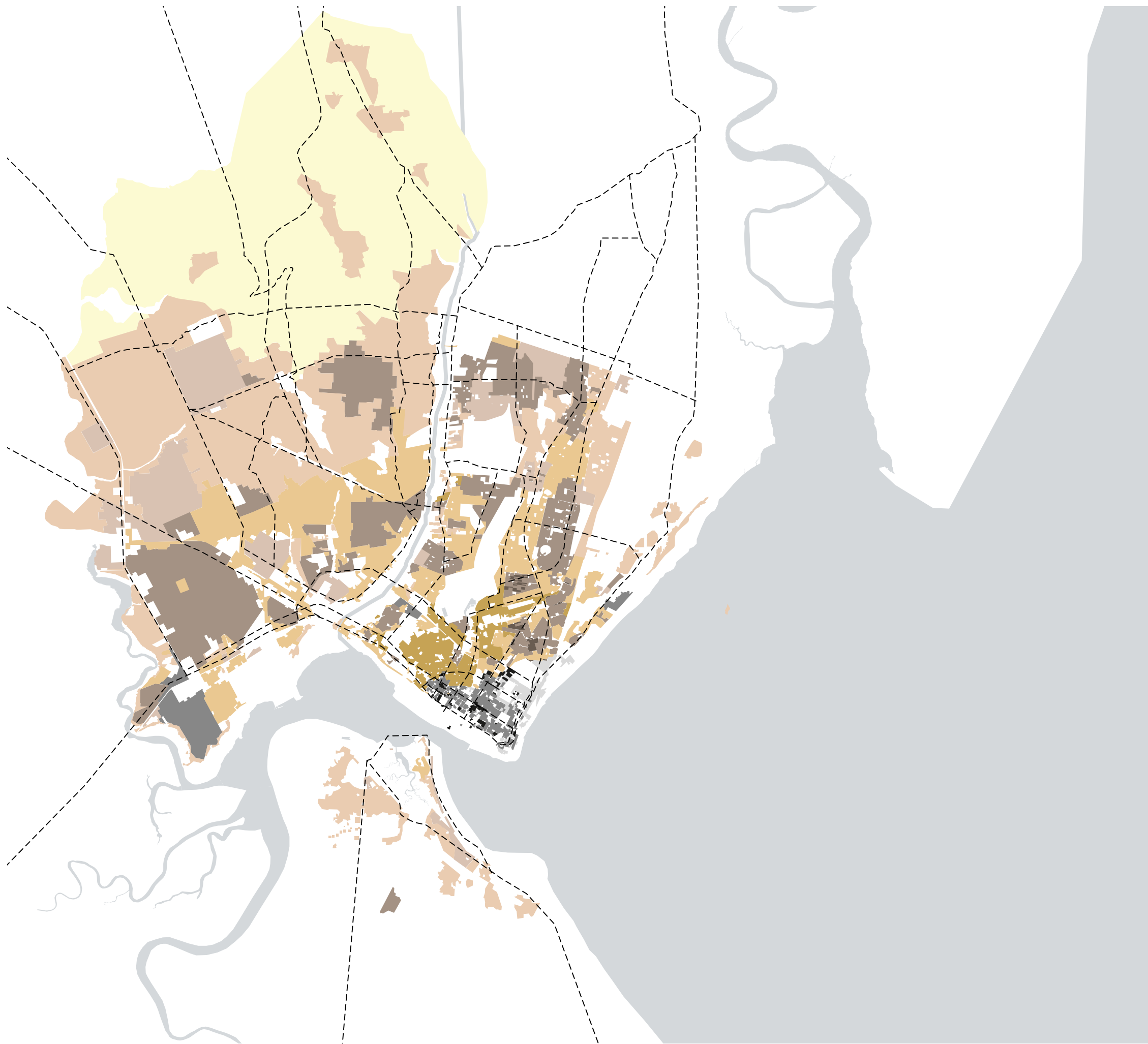
On the other hand, the main industrial areas are located in the area of Matola, cluster of industrial activities. It can be perceived the relation of industrial activities and main infrastructures lines.

Finally, the productive nodes illustrate the most active parts of the cities, highlighting in both cases the current city centres of Maputo and Matola.

5

LAYER ANALYSIS.
LAYER 4-
PRODUCTION-
CONSUMPTION

Author: Concepción del Rocío Aranda Iglesias
Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)
References: Google maps and google earth, to compare the data obtained with the current reality of the area.



- LEYEND**
- Main infrastructures
 - Consolidated residential areas
 - Low density (<20hab/ha)
 - Medium density
 - High density (>60hab/ha)
 - Planned residential areas
 - Low density (<20hab/ha)
 - Medium density
 - High density (>60hab/ha)
 - Non planned residential areas
 - Not occupied
 - Low density (<20hab/ha)
 - Medium density
 - High density (>60hab/ha)

DESCRIPTION

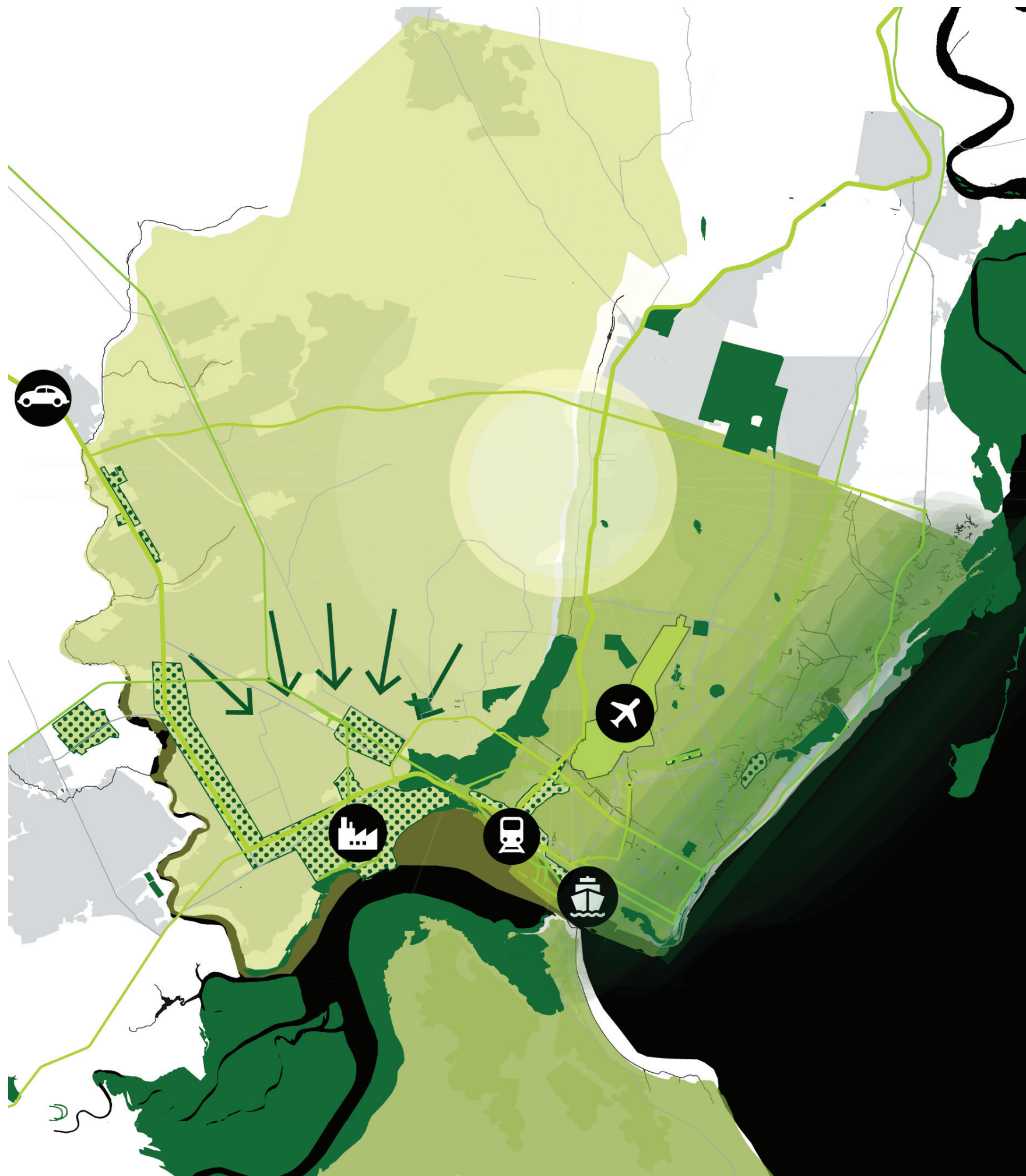
The population of Maputo Metropolitan Area is explained in detail and based on numbers from the Statistics Institute of Mozambique in the section of the Growth study of this report.

As can be understood in the population map, the whole extension of the cities are occupied by residential areas on their majority. The extension of the urban areas had a north direction, having the southern city centres as focus of expansion. That is why in the northern part of the cities, there is a less compact urban pattern.

6

**LAYER ANALYSIS.
LAYER 5-
POPULATION**

Author: Concepción del Rocío Aranda Iglesias
Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)
References: Google maps and google earth, to compare the data obtained with the current reality of the area.



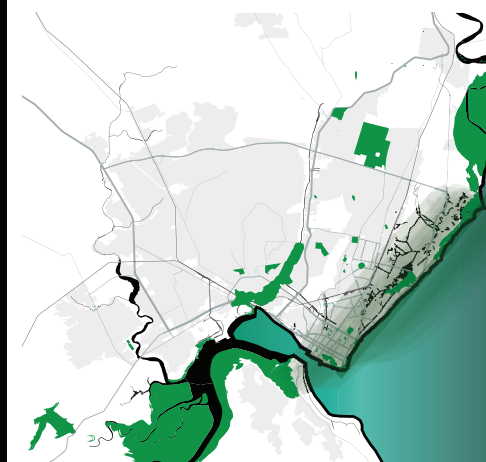
Centralization of industry



Multi-modality



The Metropolitan Area



Urban landscape and tourism

DESCRIPTION

The strengths refer to internal attributes and resources that support a successful outcome. They are related with the current state of the area to explore.

The main strengths of the Maputo Metropolitan Area rely on its strategical location, close to natural resources and accessibility opportunities. At the same time, despite the precarious conditions of its current urban extension, there are several positive factors to foster.

CENTRALIZATION OF INDUSTRY

The location of the main industries of the area are focus on certain spaces that can be understood as industrial hubs. This allows a special planning for them and linked resources.

MULTI - MODALITY

Because of its proximity to the sea, the Maputo Metropolitan Area count on a multi-canal access possibility because of its airport, port, road infrastructure and railway.

THE METROPOLITAN AREA

Because of its continuous urban extension, the cities of Maputo and Matola, biggest cities of the country, can be understood as a unit. If both rely on each other, there are several opportunities of enhancing the current poverty situation

URBAN LANDSCAPE AND TOURISM

The coast extension of the area in cooperation with the natural parks around it provide a famous touristic landmark for the inhabitants of Mozambique and South Africa. It is the closest beach destination for cities like Pretoria or Johannesburg

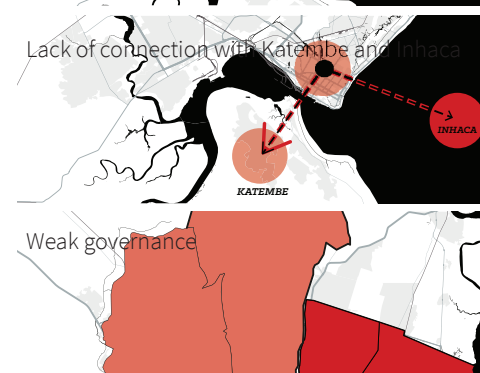
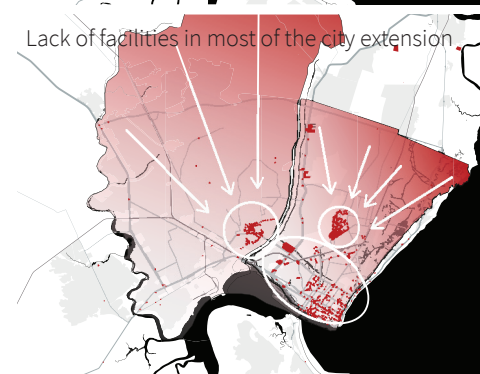
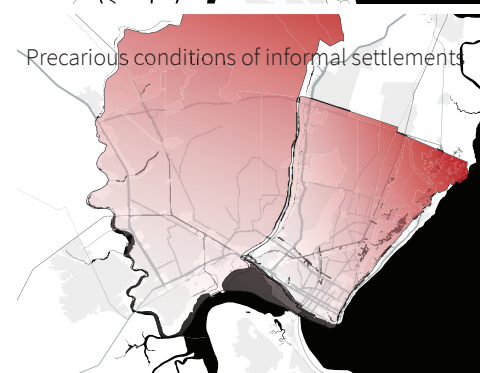
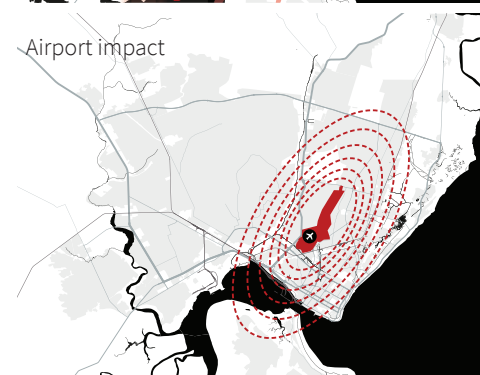
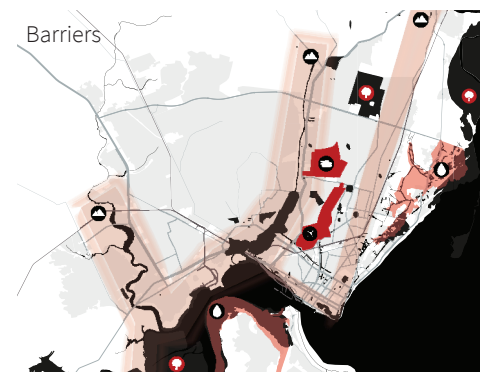
7

SWOT ANALYSIS STRENGHTS

Author: Concepción del Rocío Aranda Iglesias

Sources: layer analysis maps

References: Jenkins, P. (2000); Boyd, E., Ensor, J., Broto, V. C., & Juhola, S. (2014); Municipality of Maputo, T. (2008). Plano de Estrutura Urbana Do Município de Maputo; Pestana Barros, C., Chibangue, A., & Samagaio, A. (2014). Mendes de Araújo, M. G. (2003). Mendes de Araújo, M. G. (1999)



DESCRIPTION

The weaknesses refer to internal attributes and resources that work against a successful outcome. They are related with the current state of the area to explore.

The weaknesses are defined by its current barriers and lack of services and connections. This are the main causes of the current precarious situation of the informal settlements in the extension of the city.

BARRIERS

There are several things that prevent the development to happen in those areas. The ground level that represents a barrier for the urban tissue: flooding areas, airport and military base areas, reserved natural spaces and high topographical changes.

AIRPORT IMPACT

The airport has a big sound and pollution impact towards the whole extension of the city of Maputo.

PRECARIOUS CONDITIONS OF INFORMAL SETTLEMENTS.

70% of the city's population is living in slums. These areas are progressively less conditioned as far as the distance from the city centre increases.

LACK OF FACILITIES IN MOST OF THE CITY EXTENSION.

The current facilities locations (administrative, commercial and leisure) illustrate the lack of activity hubs in the extensions of the city, which suppose a big pressure on the city centres.

LACK OF CONNECTION WITH KATEMBE AND INHACA.

The lack of urban extension in Inhaca and Katembe are caused by the lack of connection.

WEAK GOVERNANCE.

The division of the metropolitan area and the disconnection of the government and the citizen's (explained in the theory paper) increase the difficulties of a sustainable urban development.

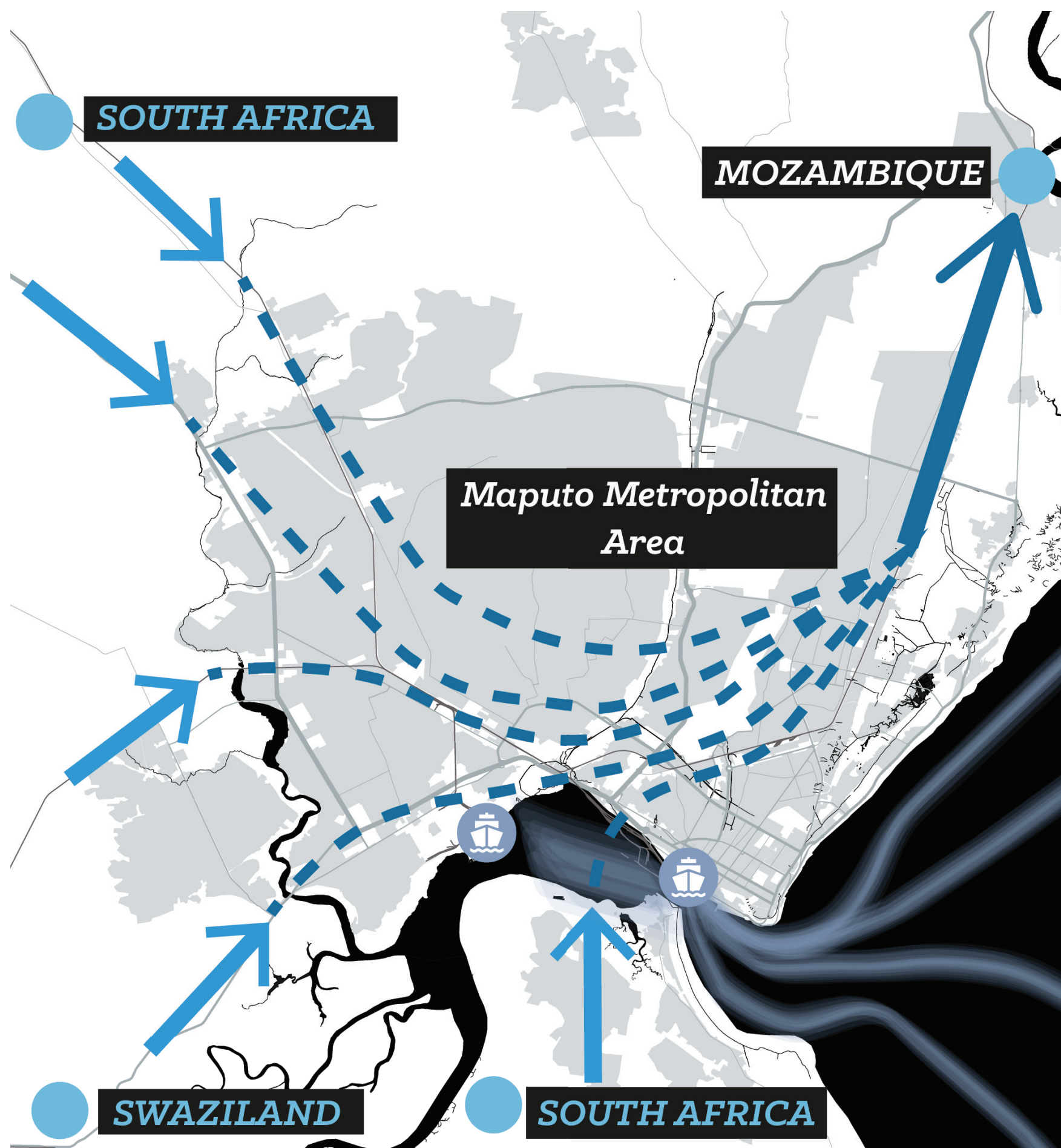
8

SWOT ANALYSIS WEAKNESSES

Author: Concepción del Rocío Aranda Iglesias

Sources: layer analysis maps

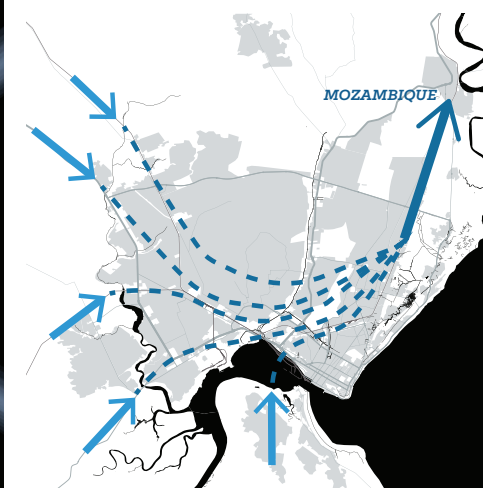
References: Jenkins, P. (2000); Boyd, E., Ensor, J., Broto, V. C., & Juhola, S. (2014); Municipality of Maputo, T. (2008). Plano de Estrutura Urbana Do Município de Maputo; Pestana Barros, C., Chibangue, A., & Samagaio, A. (2014). Mendes de Araújo, M. G. (2003). Mendes de Araújo, M. G. (1999)



Cross-border connection



Maritime international relations



Front door for the whole country

DESCRIPTION

The opportunities refer to external factors that the area can capitalize on or use to its advantage. They are related with what the future state of the area could be.

In relation to the external qualities, the opportunities are focused on the possibility of upgrade the cross-border relations by maritime routes or with the surrounding countries.

CROSS-BORDER CONNECTIONS

There are several opportunities to create projects, policies and programs in collaboration with the surrounding countries of South Africa and Swaziland. The Maputo Metropolitan Area is connected to big cities of South Africa like Johannesburg and Pretoria; this closeness can suppose a fruitful development prospect.

MARITIME INTERNATIONAL RELATIONS

The port of Maputo and Matola is one of the most important in the Southern Africa Region. It has several trade agreements with South Africa and Swaziland with support of the railway infrastructure to cover the land distance with the main cities of these countries.

FRONT DOOR FOR THE WHOLE COUNTRY

Because of its position, the capital city of Maputo represents the entrance gate for the rest of the country in the North of it. The infrastructures that connect the different surrounding countries with Maputo serve as bottleneck of connection with the rest of the country and vice-versa.

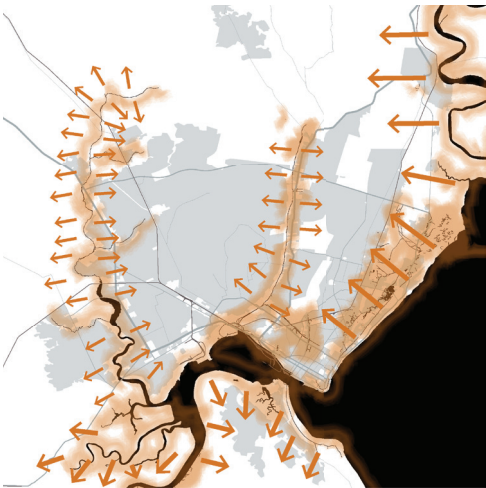
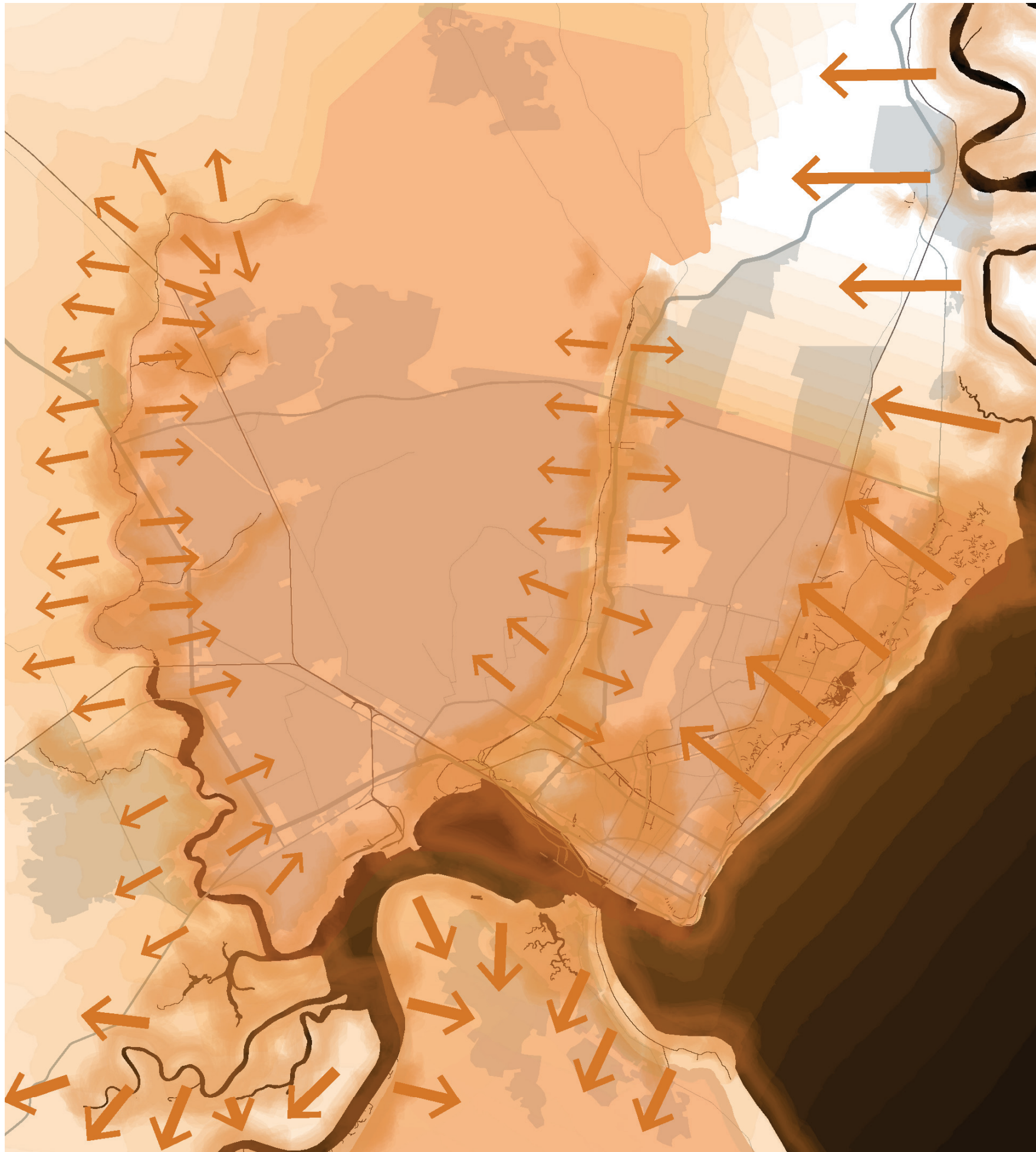
9

SWOT ANALYSIS OPPORTUNITIES

Author: Concepción del Rocío Aranda Iglesias

Sources: layer analysis maps

References: Rouse, M. (2017). SWOT analysis (strengths, weaknesses, opportunities and threats analysis). Retrieved from <http://searchcio.techtarget.com/definition/SWOT-analysis-strengths-weaknesses-opportunities-and-threats-analysis> Jenkins, P. (2000); Boyd, E., Ensor, J., Broto, V. C., & Juhola, S. (2014); Municipality of Maputo, T. (2008). Plano de Estrutura Urbana Do Município de Maputo; Pestana Barros, C., Chibangue, A., & Samagaio, A. (2014). Mendes de Araújo, M. G. (2003). Mendes de Araújo, M. G. (1999)



Climate change - Raise sea level



Expected growth

DESCRIPTION

The threats refer to external factors that could jeopardize the entity's success. They are related with what the future state of the area could be.

Finally, the threats are linked to the global problems like climate change and its water level arise and the world population growth, that has a big impact in the African context.

CLIMATE CHANGE - RAISE SEA LEVEL

Because of its location in a coast line, the area will suffer an increase of the flooding problem as a consequence of the raise of sea level. It is essential to conduct prevention measurements and adapt the areas that will be under flooding danger.

EXPECTED GROWTH

According to the INE projections, the area is expecting a continuous growth in the next years, reaching a 54% growth rate for 2040. This will aggravate the current problems like the precarious situation of the 70% of people living in informal settlements.

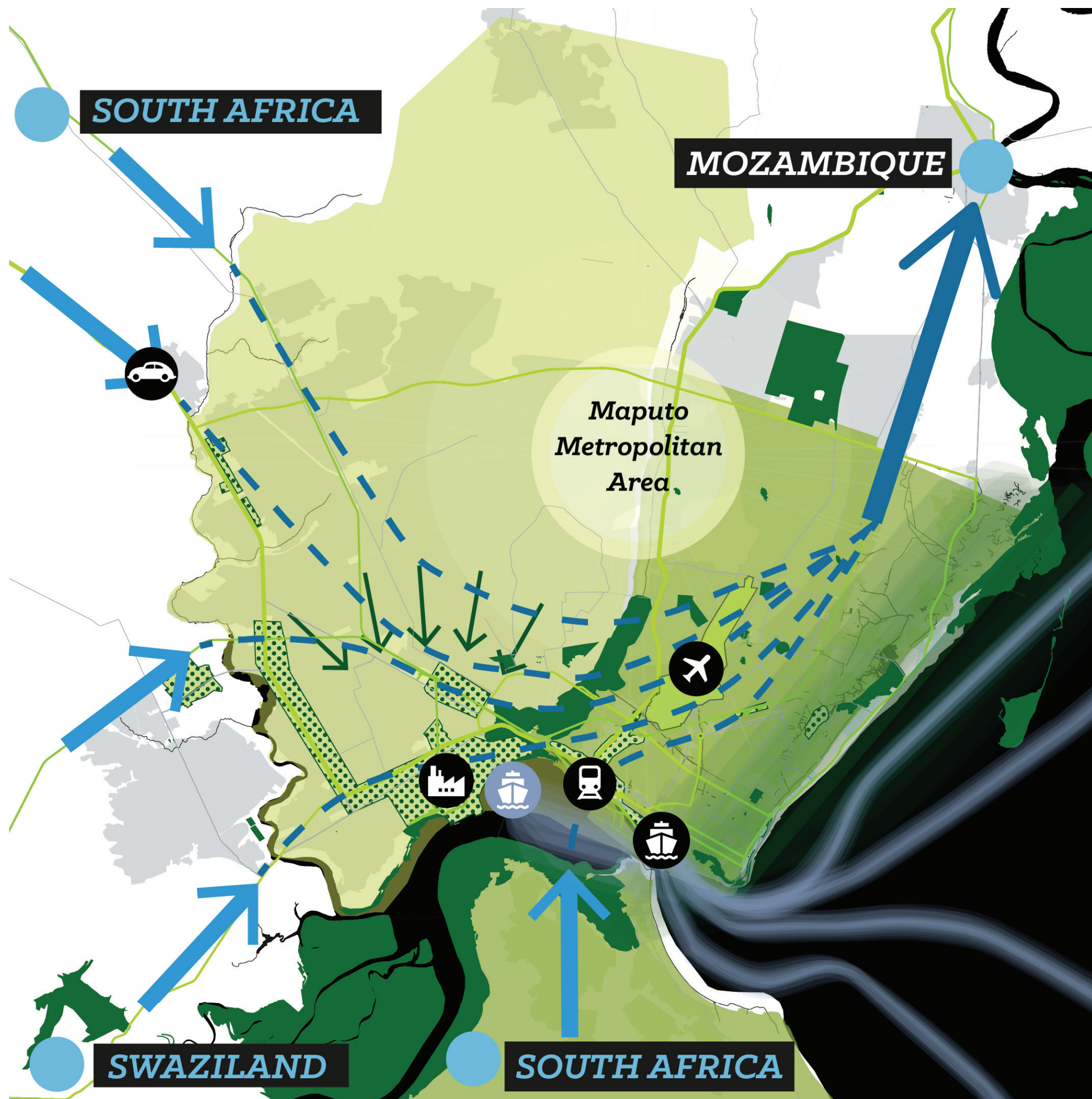
10

SWOT ANALYSIS THREATS

Author: Concepción del Rocío Aranda Iglesias

Sources: layer analysis maps

References: Rouse, M. (2017). SWOT analysis (strengths, weaknesses, opportunities and threats analysis). Retrieved from <http://searchcio.techtarget.com/definition/SWOT-analysis-strengths-weaknesses-opportunities-and-threats-analysis> Jenkins, P. (2000); Boyd, E., Ensor, J., Broto, V. C., & Juhola, S. (2014); Municipality of Maputo, T. (2008). Plano de Estrutura Urbana Do Município de Maputo; Pestana Barros, C., Chibangue, A., & Samagaio, A. (2014). Mendes de Araújo, M. G. (2003). Mendes de Araújo, M. G. (1999)



DESCRIPTION

In order to apply the diagnosis from the SWOT analysis, it is essential to highlight the main positive conclusions.

This map illustrated the strategical location of the Maputo Port for the country and the opportunity of improving the multi modality mobility to access the metropolitan area. and promote its international image This should be part of the future development proposed and strength the vision of the area by creating a Transport Oriented Development.

At the same time, the industrial areas lead a development into an industrialization process with an innovative sustainable approach that do not transform the industrial opportunities in threats. Finally, the natural richness of the country is one of its most valorated qualities, these areas should be preserved and foster to increase the attraction prevent the urban extension over them.

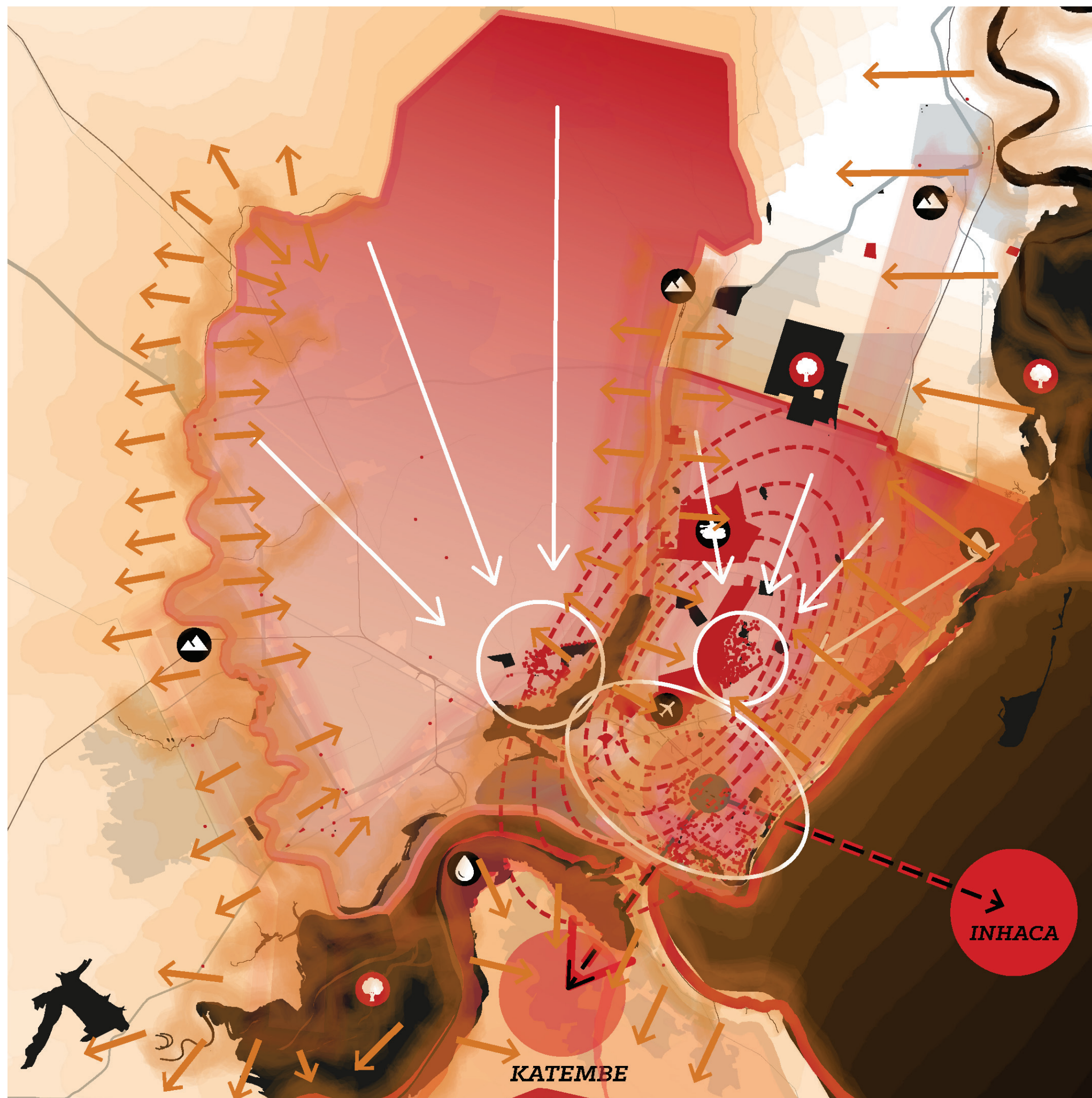
11

**SWOT ANALYSIS
CONCLUSIONS
TO FOSTER
Strenghts+Opportunities**

Author: Concepción del Rocío Aranda Iglesias

Sources: layer analysis maps

References: Rouse, M. (2017). SWOT analysis (strengths, weaknesses, opportunities and threats analysis). Retrieved from <http://searchcio.techtarget.com/definition/SWOT-analysis-strengths-weaknesses-opportunities-and-threats-analysis> Jenkins, P. (2000); Boyd, E., Ensor, J., Broto, V. C., & Juhola, S. (2014); Municipality of Maputo, T. (2008). Plano de Estrutura Urbana Do Município de Maputo; Pestana Barros, C., Chibangue, A., & Samagaio, A. (2014). Mendes de Araújo, M. G. (2003). Mendes de Araújo, M. G. (1999)



DESCRIPTION

In order to apply the diagnosis from the SWOT analysis, it is essential to highlight those aspects that suppose a negative influence for the development.

Summarizing the aspects to implement or transform, it is essential to release some pressure from the current city centres of Maputo and Matola. Therefore, an increasing of the services within the extensions of the city will introduce better conditions in the informal settlements.

At the same time, implementing the connections of the city with the annexed areas of Maputo (Inhaca and Katembe) and within the city extension.

Finally, to improve the living conditions by controlling the different barriers that currently suppose a negative factor for the cities.

12

**SWOT ANALYSIS
CONCLUSIONS
TO IMPLEMENT
Weaknesses+Threats**

Author: Concepción del Rocío Aranda Iglesias

Sources: layer analysis maps

References: Rouse, M. (2017). SWOT analysis (strengths, weaknesses, opportunities and threats analysis). Retrieved from <http://searchcio.techtarget.com/definition/SWOT-analysis-strengths-weaknesses-opportunities-and-threats-analysis> Jenkins, P. (2000); Boyd, E., Ensor, J., Broto, V. C., & Juhola, S. (2014); Municipality of Maputo, T. (2008). Plano de Estrutura Urbana Do Município de Maputo; Pestana Barros, C., Chibangue, A., & Samagaio, A. (2014). Mendes de Araújo, M. G. (2003). Mendes de Araújo, M. G. (1999)

DESCRIPTION

Historical remark - Maputo and Matola are the two biggest cities in the country. At the same time, both are experimenting a continuous growth. Matola is currently experiencing a bigger growth than Maputo. The causes of these growth trend are historical.

1960 - Industrial boom in Matola: Residential urban architecture for the colonial burguesy

1960-1970 - Colonial policy: Urban expansion for the colonial working classes with incentives to build your own house. Creation of new neighbourhoods

1960-1970 - Industrial expansion in Matola and Machava. Suburban areas of Matola for the working people.

1960-1970 - Negative growth in Lourenço Marques. During the independence war, the Portuguese population returned to Portugal.

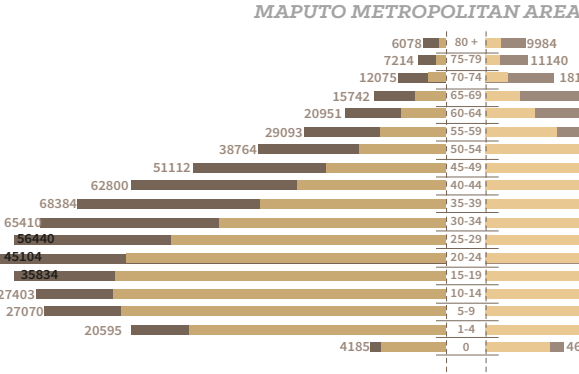
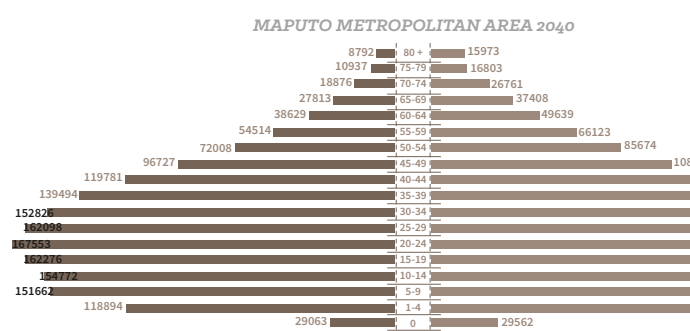
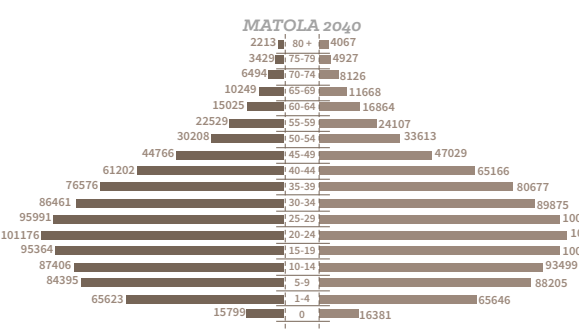
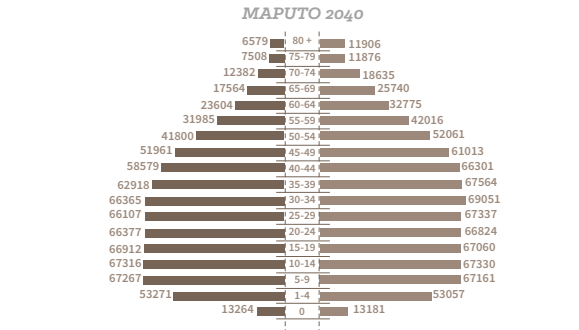
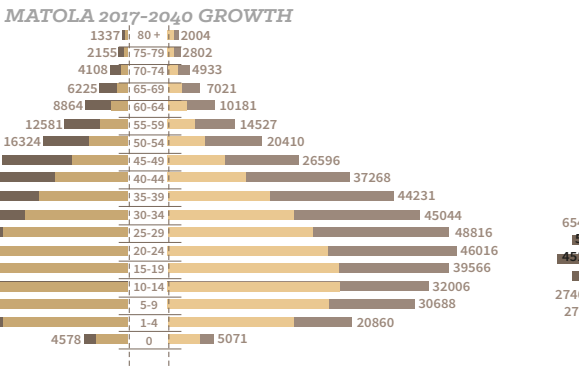
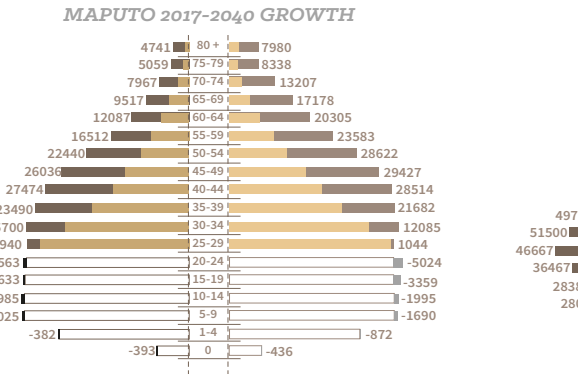
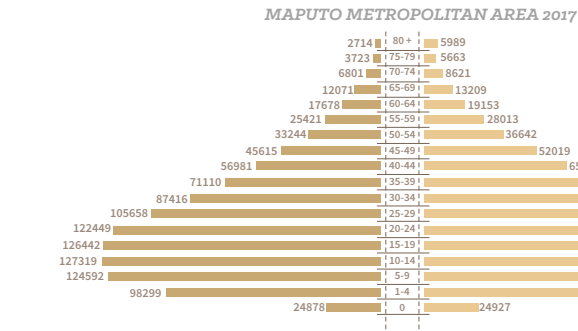
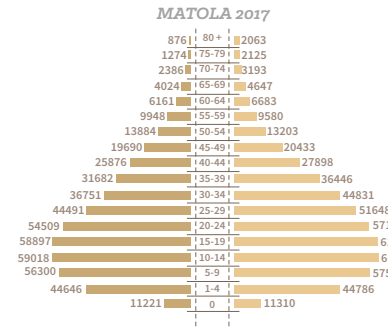
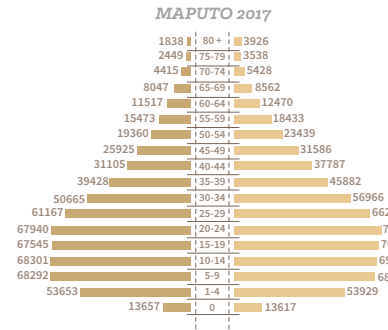
1970-1980 - National independence. Shift in the urban population in Mozambique. Occupation of the abandoned colonial spaces. More evident in Matola where the suburban spaces grew to absorb the migration to Maputo.

1980 - Migration from rural to urban areas. Because of the civil war, the rural areas became unsecured. At the same time, several natural disasters led to a failure in the agricultural sector.

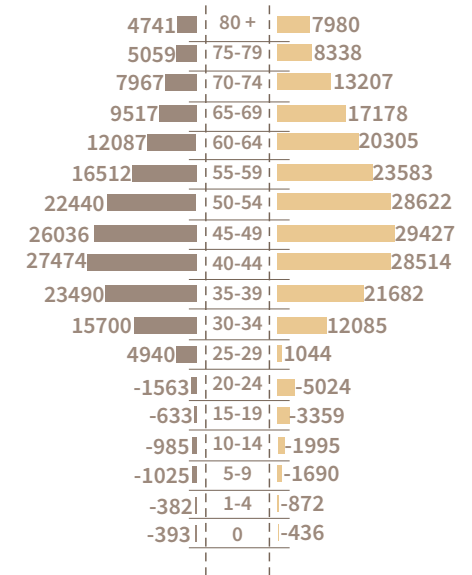
The graphs show the growth trend in MMA from 2017 to 2040 separated between women (right) and men (left). As can be perceived from the illustration of the growth, there is negative trend in early age in the city of Maputo and the growth in Matola is bigger than in Maputo.

These graphs will be used to represent a growth profile that will help to frame the development strategy for MMA 2040.

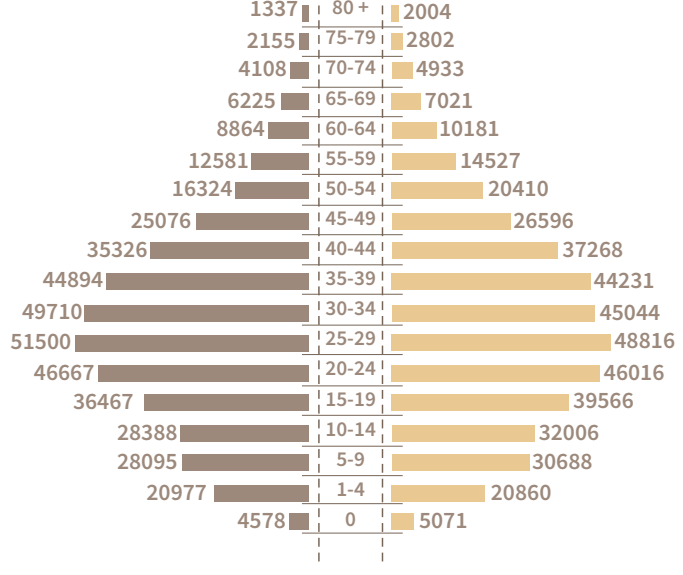
Author: Concepción del Rocío Aranda Iglesias
Sources: graphics by author
References: Mozambique, I. (2012). Projeccoes anuais da população total, urbana e rural, dos distritos da cidade de Maputo 2007-2040.



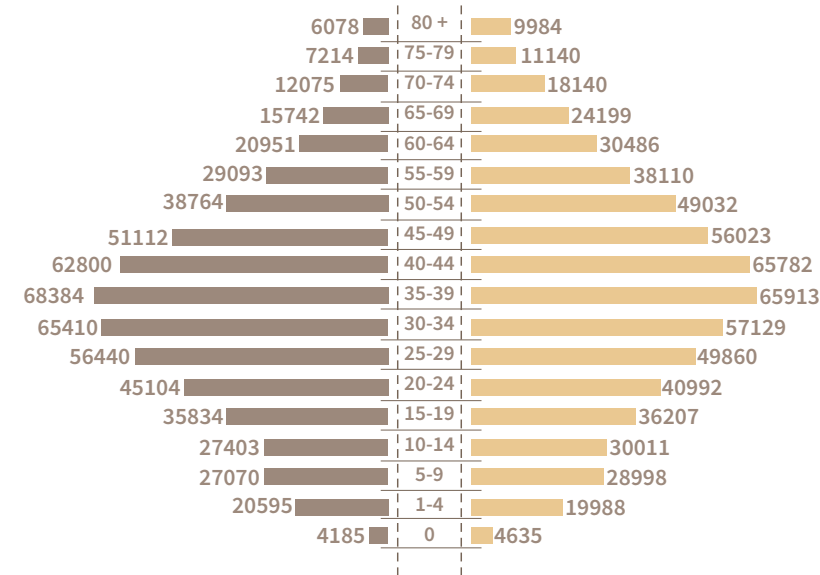
MAPUTO 2017-2040 GROWTH



MATOLA 2017-2040 GROWTH



MAPUTO METROPOLITAN AREA GROWTH



According to INE expected population

ASPECT	MAPUTO	MATOLA	MAPUTO METROPOLITAN AREA	MAPUTO PROVINCE	MOZAMBIQUE	% OF THE PROVINCE	% OF COUNTRY
INE POPULATION	1178116,00	827475,00	2005591,00	1506442,00			
POPULATION 2017 (PROJECCION)	1273076,00	997702,00	2270778,00	1858597,00	28829476,00		6,45
ANNUAL GROWTH (%)	4,07	5,28	4,68				
SURFACE (ha)	34700,00	36700,00	71400,00	23276,00	799380,00	306,75	8,93
POPULATION DENSITY (hab/ha)	36,69	27,19	31,94	64,70		49,36	
POPULATION 2040	1642647,00	1859014,00	3501661,00	4489170,00			
POPULATION URB 2040	1642647,00	1859014,00	3501661,00	3484518,00			
POPULATION RURAL 2040	0,00	0,00	0,00	1004652,00			
POPULATION FEM 2040	860888,00	954108,00	1814996,00	2323511,00			
POPULATION MASC 2040	781759,00	904905,00	1686664,00	2165659,00			

GROWTH	POPULATION NOW	POPULATION IN 2040	NEW POPULATION	GROWTH % (from current)	GROWTH BY YEAR	GROWTH UN	DENSITY	SURFACE NEEDED (ha)	SURFACE GROWTH (%)
MAPUTO	1273076,00	1642647,00	369571,00	29,03	1,26	4,07	36,69	10073,33	29,03
MATOLA	997702,00	1859014,00	861312,00	86,33	3,75	5,28	27,19	31682,96	86,33
MAPUTO METROPOLITAN AREA	2270778,00	3501661,00	1230883,00	54,21	2,36		31,94	38541,33	53,98

According to latest population census - 2017

ASPECT	MAPUTO	MATOLA	MAPUTO METROPOLITAN AREA	MAPUTO PROVINCE	MOZAMBIQUE	% OF THE PROVINCE	% OF COUNTRY
INE POPULATION	1178116,00	827475,00	2005591,00	1506442,00			
POPULATION 2017 (PROJECCION)	1616267,00	1101170,00	2717437,00	1858597,00	28829476,00		6,45
ANNUAL GROWTH (%)	4,07	5,28	4,68				
SURFACE (ha)	34700,00	36700,00	71400,00	23276,00	799380,00	306,75	8,93
POPULATION DENSITY (hab/ha)	46,58	30,00	38,29	64,70		59,18	
POPULATION 2040	1642647,00	1859014,00	3501661,00	4489170,00			
POPULATION URB 2040	1642647,00	1859014,00	3501661,00	3484518,00			
POPULATION RURAL 2040	0,00	0,00	0,00	1004652,00			
POPULATION FEM 2040	860888,00	954108,00	1814996,00	2323511,00			
POPULATION MASC 2040	781759,00	904905,00	1686664,00	2165659,00			

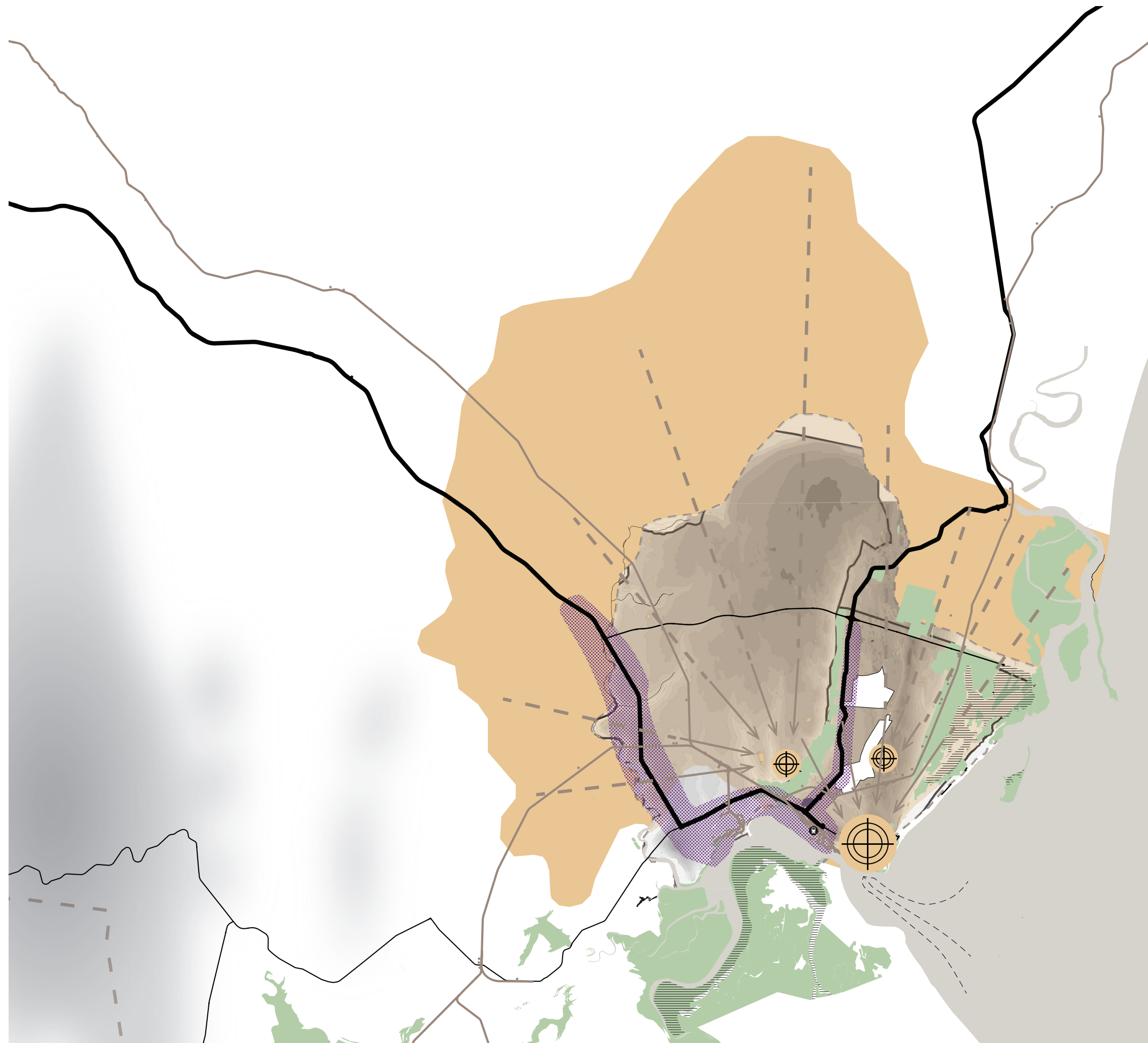
GROWTH	POPULATION NOW	POPULATION IN 2040	NEW POPULATION	GROWTH % (from current)	GROWTH BY YEAR	GROWTH UN	DENSITY	SURFACE NEEDED (ha)	SURFACE GROWTH (%)
MAPUTO	1616267,00	1642647,00	26380,00	1,63	0,07	4,07	46,58	566,36	1,63
MATOLA	1101170,00	1859014,00	757844,00	68,82	2,99	5,28	30,00	25257,57	68,82
MAPUTO METROPOLITAN AREA	2717437,00	3501661,00	784224,00	28,86	1,25		38,29	20480,39	28,68

DESCRIPTION

- Growing population profile -**
- 1. Working age.** As represented in the growth study, the majority of the growth is centred between 20 and 55 years. This group of people represent the working age. This supposed a necessity to plan the development areas with work load to be hired and trained.
- 2. Women.** Within the comparison between genres, the data states that the women growth will be higher than the men's one. At the same time, the main age range is on fertile age, which will ensure the continuing of the growing trend.
- 3. From Matola.** Matola presents a big growing tendency in the represented statics. In the whole Maputo Metropolitan Area, the biggest growth will come from the current urban extension of the city. On the other hand, the growth from Maputo, while still high, is not so prominent.
- 4. Change the pyramid.** The growth will change the current population pyramid by narrowing the ages between 0-24 years; mainly because of the negative growth experienced in the city of Maputo.

This represents that, while the population is growing, it is not expected that the life expectancy will increase, and therefore, upgrade the live conditions. The Maputo Metropolitan Area is not understood currently as an administrative unit, therefore there is not data available for that region. This table is intended to give an insight in the reality of the growth studied in this thesis and the expected population increase that will be plan. In order to develop this statics, the main source were the INE and the UN Habitat statics, always comparing data from each source only with its own data to try to calculate a reliable data source for the design proposal. The main data to be understood from these statics give an insight on the current population of the Maputo Metropolitan Area: 2.270.778 people (according to the INE statistics) and 2.717.427 people according to the last census, in an area of 71400 ha. This illustrates that the current population is bigger than the expected by the INE, which means that the growth will be higher than the expected. Considering the current population and the expected for 2040, the growth will be 29%. Considering the expected population for 2017 and the expected population for 2040, the growth would be 54%. Due to the differences, this author decided to consider the 54% because it will be closer to the reality.

Author: Concepción del Rocío Aranda Iglesias
Sources: graphics by author
References: Mozambique, I. (2012). Projeccoes anuais da população total, urbana e rural, dos distritos da cidade de Maputo 2007-2040. UN-Habitat. (2010). MOZAMBIQUE CITIES PROFILE. MAPUTO, NACALA AND MANICA.



LEYEND

BASE MAP

- natural landscape
- topography
- roads
- railway
- industrial areas
- city centers
- water
- flooding areas
- national administrative borders

PROPOSAL

- development
- option 1
- option 2
- option 1: different urban areas
- option 2: compact urban development
- connections
- connection node

DESCRIPTION

Illustration of what would happen if the development continuous with the current urban trends of informal settlements and low density sprawl typologies.

PROS

- attached to the context
- informal settlements with initial guidelines
- easy trend to pursue

CONS

- low density: sprawl
- natural damage
- unconnection with current infrastructures
- increase precarious living conditions| slums
- periphery unsustainable > ecologically, socially and economically
- more pressure to current city centres

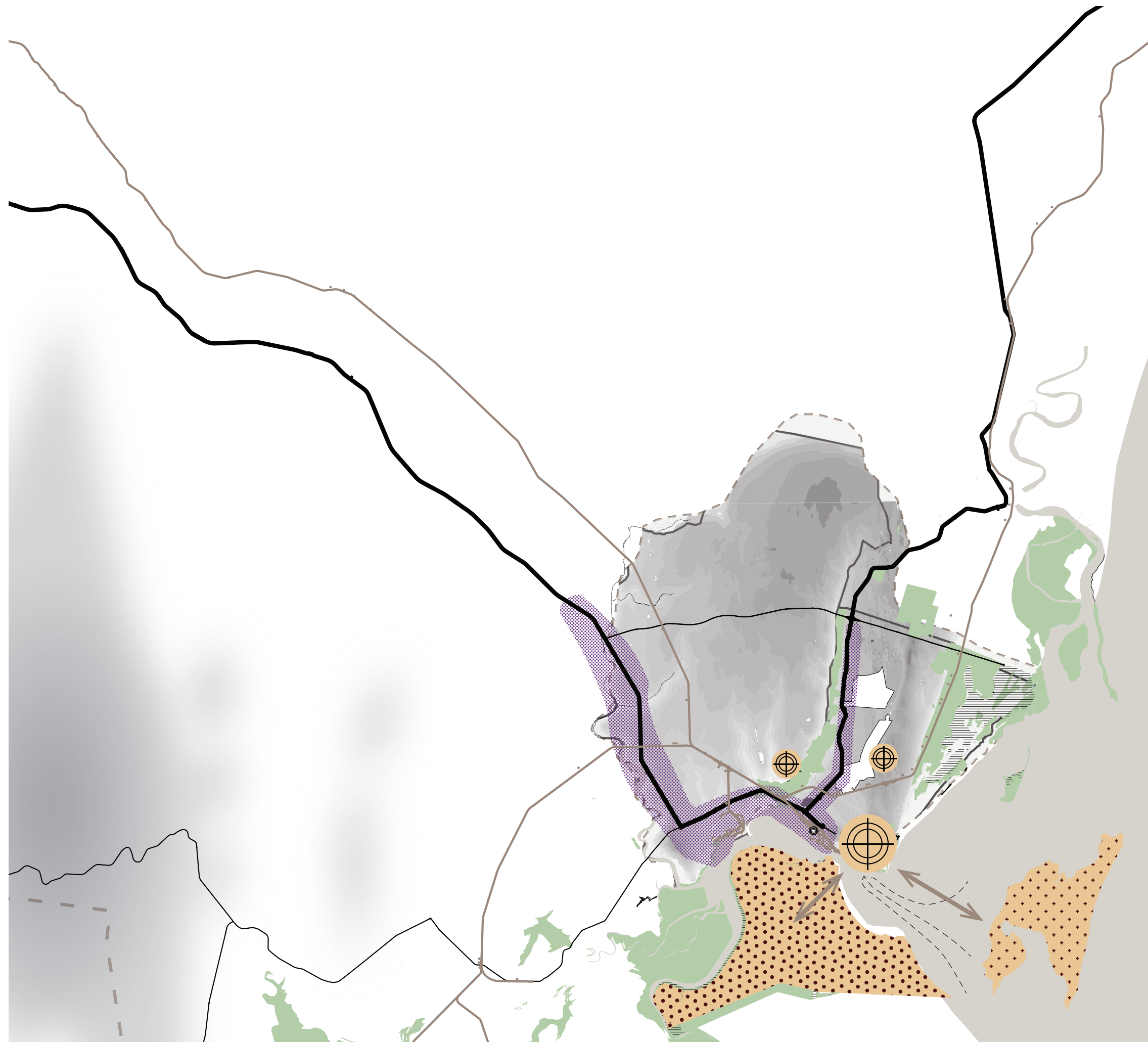
15

SCENARIOS STUDY
SCENARIO 1.
NADA

Author: Concepción del Rocío Aranda Iglesias

Sources: mapped by author from layer analysis maps and SWOT analysis. GIS data and PEUMM 2008 plans from municipality.

References: Durance, P., & Godet, M. (2010). Scenario building: Uses and abuses. Technological forecasting & Social change, 77, 1488-1492.



LEYEND

BASE MAP

natural landscape

topography

roads

railway

industrial areas

city centers

water

flooding areas

national administrative borders

PROPOSAL

development

option 1

option 2

connections

connection node

option 1: different urban areas

option 2: compact urban development

DESCRIPTION

This scenario visualize what would happen if the natural reservoirs are forgotten and the urban sprawl conquer them for residential uses, something that has been proposed in some official urban plans in the country.

PROS

- within Maputo Metropolitan Area current area
- necessity of new connections with Katembe and Inhaca
- good natural quality in the possible new urban development

CONS

- destruction of natural spaces
- disconnection with current infrastructures
- more distance with surrounding countries
- increasing of flooding problems
- more pressure on Maputo city centre
- difficulties in goods' provision

16

SCENARIOS STUDY
SCENARIO 2.
ANTHROPOCENTRISM

Author: Concepción del Rocío Aranda Iglesias

Sources: mapped by author from layer analysis maps and SWOT analysis. GIS data and PEUMM 2008 plans from municipality.

References: Durance, P., & Godet, M. (2010). Scenario building: Uses and abuses. Technological forecasting & Social change, 77, 1488-1492.



LEYEND

BASE MAP

natural landscape

topography

roads

railway

industrial areas

city centers

water

flooding areas

national administrative borders

PROPOSAL

development

option 1

option 2

connections

connection node

option 1: different urban areas

option 2: compact urban development

DESCRIPTION

This illustration reflect upon the application of European planning tools to the African location without being contextualized, such as new urban area gained to the water surface

PROS

- middle location between Maputo and Matola
- ex-novo settlement : possibility of new urbanization with proper living conditions

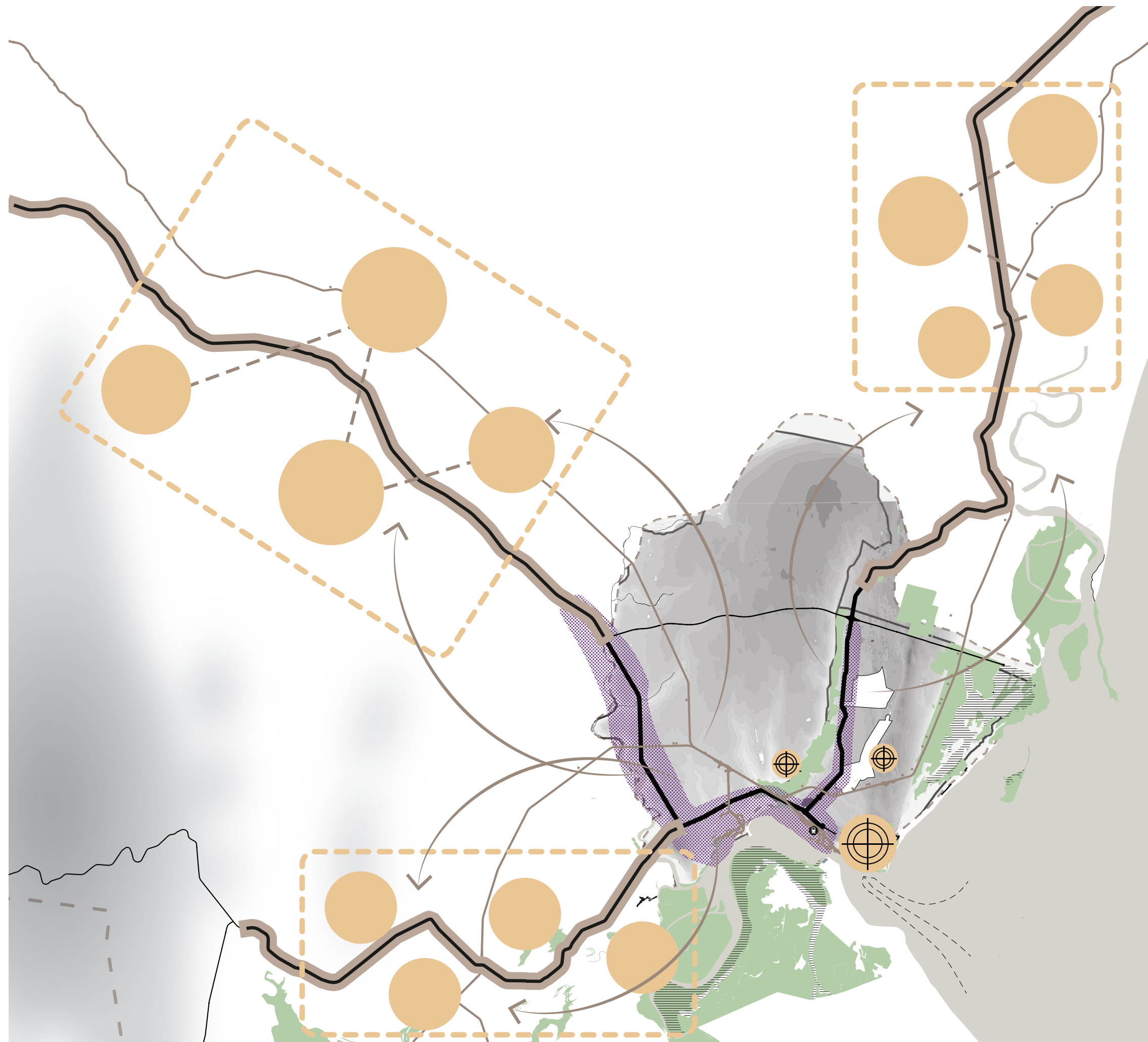
CONS

- natural damage
- outside the current infrastructure network
- financially very expensive
- totally unconnected
- increasing the pressure in Maputo city centre

17

SCENARIOS STUDY
SCENARIO 3.
OUT OF CONTEXT

Author: Concepción del Rocío Aranda Iglesias
Sources: mapped by author from layer analysis maps and SWOT analysis. GIS data and PEUMM 2008 plans from municipality.
References: Durance, P., & Godet, M. (2010). Scenario building: Uses and abuses. Technological forecasting & Social change, 77, 1488-1492.



LEYEND

BASE MAP

- natural landscape
- topography
- roads
- railway
- industrial areas
- city centers
- water
- flooding areas
- national administrative borders

PROPOSAL

- development
- option 1
- option 2
- option 1: different urban areas
- option 2: compact urban development
- connections
- connection node

DESCRIPTION

Scenario that locates the growth following the main infrastructures of the area.

PROS

- enforcement of current infrastructures
- alleviate pressure on the city centres
- possibility of connection with the industrial tissue around the roads
- new urban areas: proper living conditions
- connection with other urban areas currently in low density precarious conditions

CONS

- outside current metropolitan area extension
- disconnected with sea and nature
- necessity to erase the current urban layer over the areas that would be occupied

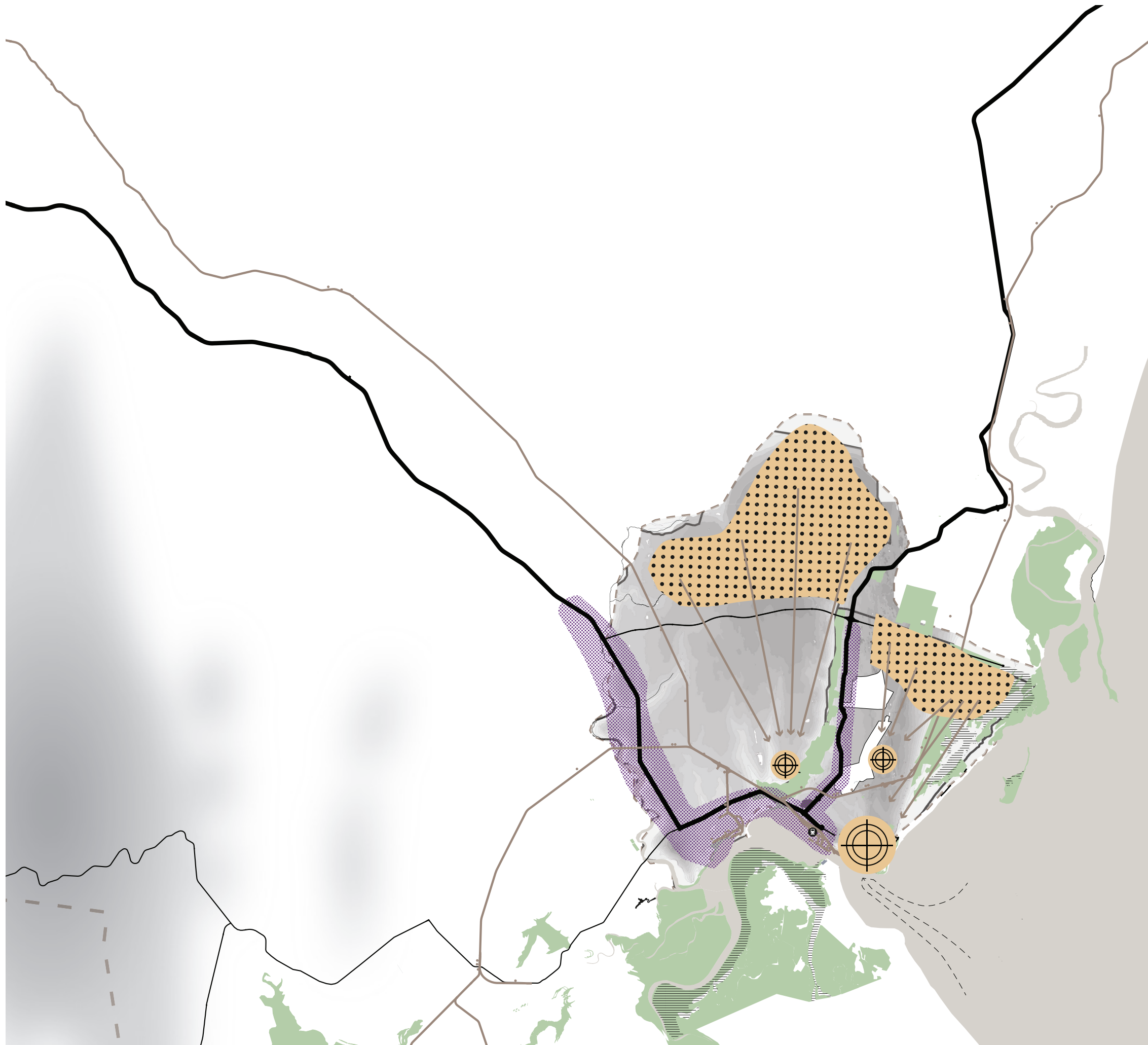
18

SCENARIOS STUDY SCENARIO 4. INFRASTRUCTURES

Author: Concepción del Rocío Aranda Iglesias

Sources: mapped by author from layer analysis maps and SWOT analysis. GIS data and PEUMM 2008 plans from municipality.

References: Durance, P., & Godet, M. (2010). Scenario building: Uses and abuses. Technological forecasting & Social change, 77, 1488-1492.



LEYEND

BASE MAP

natural landscape

topography

roads

railway

industrial areas

city centers

water

flooding areas

national administrative borders

PROPOSAL

development

option 1

option 2

connections

connection node

option 1: different urban areas

option 2: compact urban development

DESCRIPTION

Scenario focused on the densification of peripheries and improvement of the informal settlements and sprawl urban tendencies.

PROS

- within the metropolitan extension
- related to the context
- will improve the current conditions of the city
- will use the current extension and resources of the city on its maximum capacity

CONS

- add pressure to the current city centres
- necessity of dealing with the current urban layer
- need a parallel reinforcement of the infrastructures
- increasing of inequalities within the city
- more expensive than creating new areas
- difficulty in mediating with stakeholders

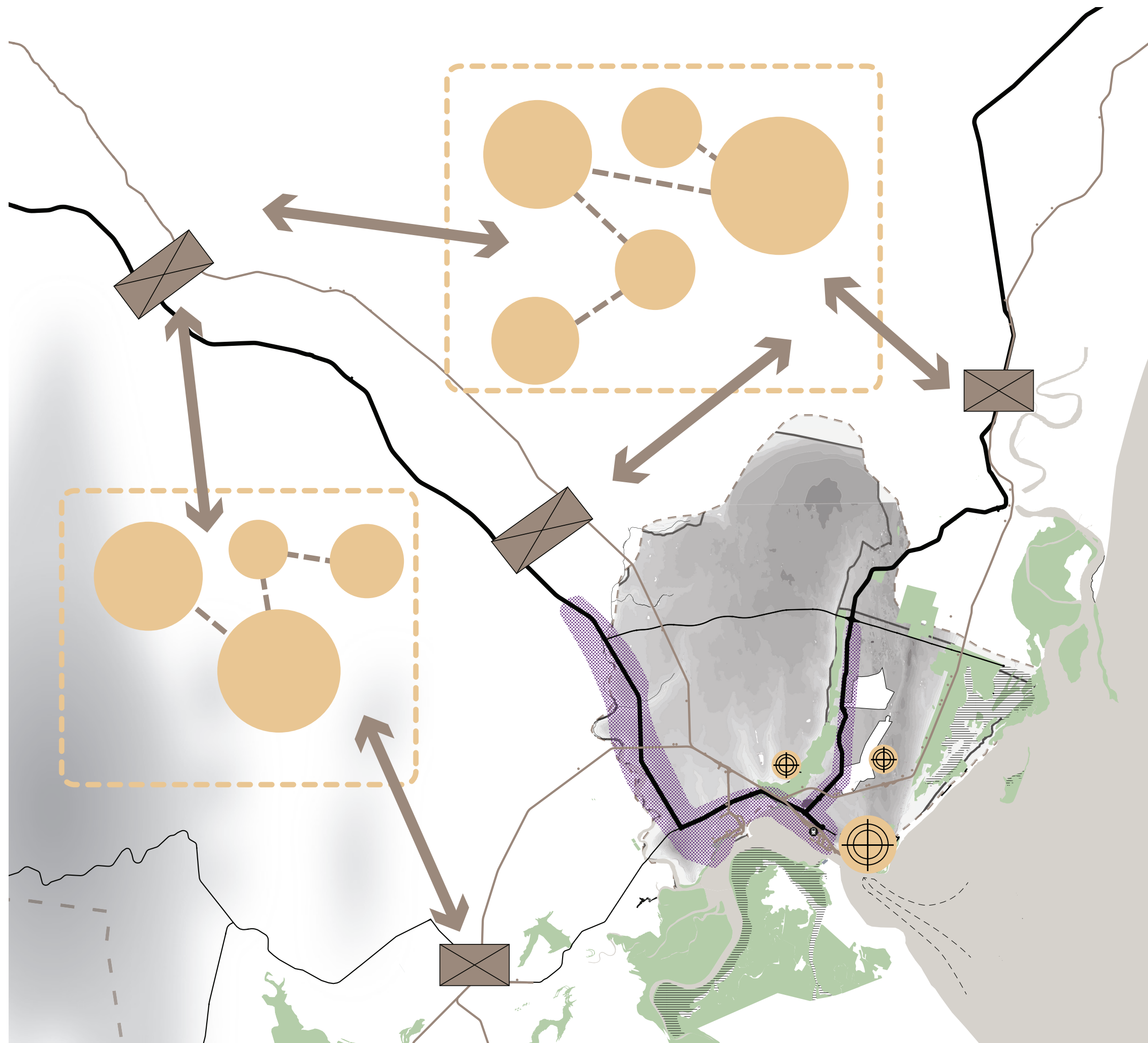
19

SCENARIOS STUDY
SCENARIO 5.
DENSIFICATION

Author: Concepción del Rocío Aranda Iglesias

Sources: mapped by author from layer analysis maps and SWOT analysis. GIS data and PEUMM 2008 plans from municipality.

References: Durance, P., & Godet, M. (2010). Scenario building: Uses and abuses. Technological forecasting & Social change, 77, 1488-1492.



LEYEND

BASE MAP

- natural landscape
- topography
- roads
- railway
- industrial areas
- city centers
- water
- flooding areas
- national administrative borders

PROPOSAL

- development
- option 1
- option 2
- option 1: different urban areas
- option 2: compact urban development
- connections
- connection node

DESCRIPTION

Proposal that locate new urban extensions in area in between currently built surface. Creating a second line of connections with the current infrastructures.

PROS

- creation of new urban areas in unused spaces without previous urban layer
- new urbanism: proper living conditions
- can be located in the most convenient area
- possibility of relation with surrounding countries

CONS

- necessity of create connections with the current infrastructures.
- disconnected from the cities
- natural impact
- difficult to relate to current industrial areas (no current infrastructures)

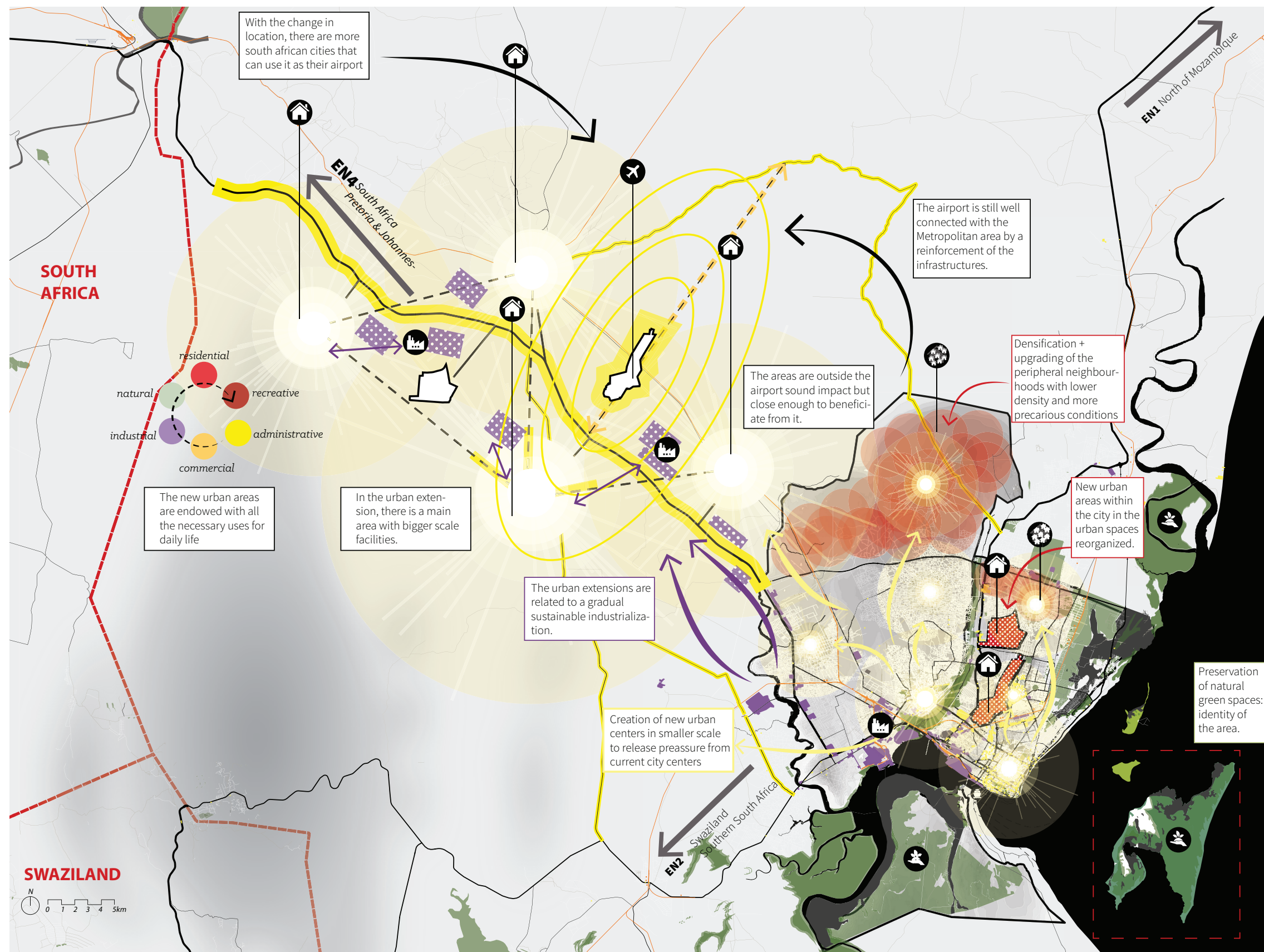
20

SCENARIOS STUDY
SCENARIO 6.
MIDDLE AREAS

Author: Concepción del Rocío Aranda Iglesias

Sources: mapped by author from layer analysis maps and SWOT analysis. GIS data and PEUMM 2008 plans from municipality.

References: Durance, P., & Godet, M. (2010). Scenario building: Uses and abuses. Technological forecasting & Social change, 77, 1488-1492.



LEYEND



NATURAL LANDSCAPE

- natural landscape
- water bodies
- flooding areas
- topography

URBAN EXTENSION

- airport
- administrative borders
- roads
- reinforced infrastructures
- railway
- urban centers



- DENSIFICATION

- densified areas



- NEW URBAN AREAS

- recovered areas within the cities
- proposed areas



- INDUSTRIAL AREAS

- current industrial areas
- proposed areas

DESCRIPTION

“Maputo Metropolitan Area 2040. An inclusive and sustainable urban development”

Due to the current development trends of the MMA, it is essential to realize an accurate urban planning for the future of the area. This vision propose an approach that guide the development towards a sustainable outcome where there are big changes of the way the urban planning have been done in the area until the moment.

The vision emphasizes on the improvement of the current precarious conditions of the informal city and the lack of proper mobility under a contextualized approach that respects the dynamics of the current city.

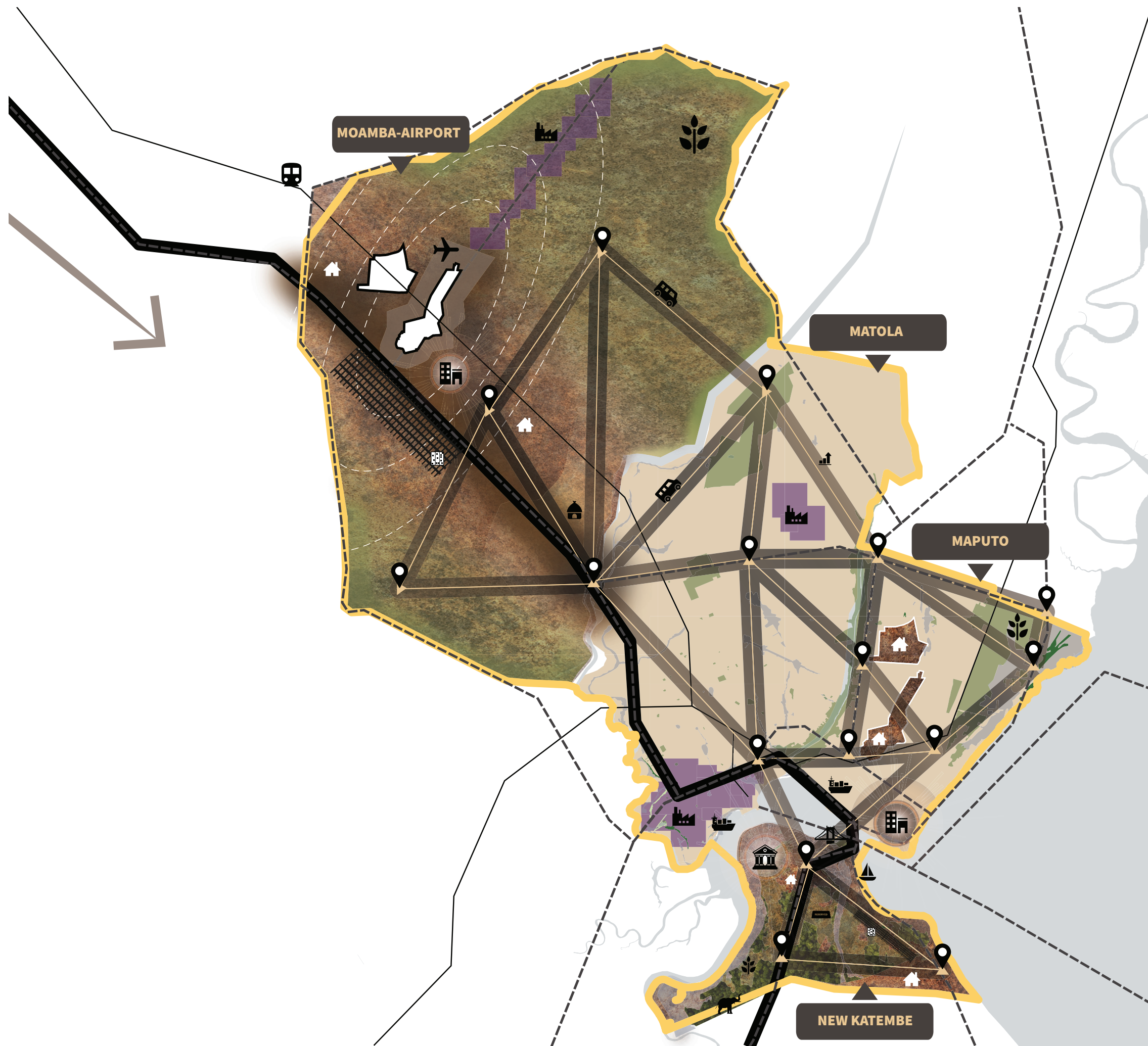
21

VISION 1.0

Author: Concepción del Rocío Aranda Iglesias

Sources: mapped from scenarios analysis evaluated with the principles of the vision. selection of scenarios 4 and 5.

References:



LEYEND

- Urban areas
- Main density area Moamba airport
- Main density area Maputo
- Formal nodes
- Informal nodes
- Possible informal nodes
- Connections & densified areas
- Industrial areas
- Main roads
- Railway
- Maputo Development Corridor
- Country limits

DEVELOPMENT
CORRIDORS

DESCRIPTION

VISION 3MK -CBD

CONTEXT BASED DEVELOPMENT

Maputo Metropolitan Area 2040

“Merging formal and informal MMA. An inclusive and sustainable urban development”

The vision for MMA 2040 presents the development of the cities of Maputo and Matola in the direction of Katembe, due to the finishing of the bridge to Maputo, and Moamba, in relation to the movement of the Maputo International airport. There is a proposal of specific areas of densification such as the old airport and military base within Maputo city or the area connected to the N4 at the new airport location (Moamba)

An improvement of the main mobility connections between the cities is proposed caused by the increasing of traffic flow related to the proposition of new centers.

At the same time, a second layer of connection within the city limits will give access to the current informal nodes and future ones. This second layer illustrates what Corridor means in the reality of the area and defines priority areas of densification in the cities. Finally, the extension of sustainable industrial areas as planning tools for income generation and job creation together with the training of local workforce.

22

VISION 3MK-CBD
Moamba-Maputo-Matola-
Katembe
Context based development

Author: Concepción del Rocío Aranda Iglesias

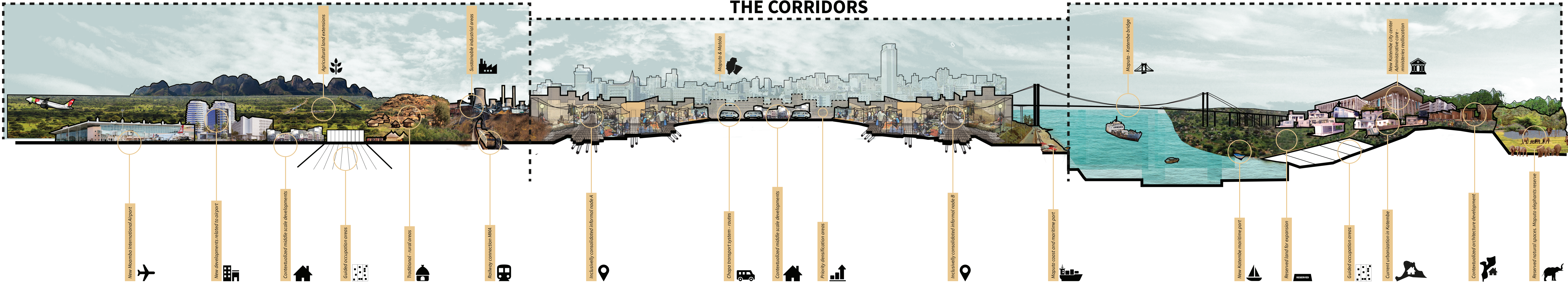
Sources: mapped from confrontation of vision 1.0 with the different stakeholders interviewed in the fieldtrip. Simplification of the final strategy.

References:

MOAMBA AIRPORT

THE CORRIDORS

NEW KATEMBE



DESCRIPTION

VISION 3MK -CBD
CONTEXT BASED DEVELOPMENT
Maputo Metropolitan Area 2040
"Merging formal and informal MMA. An inclusive and sustainable urban development"

In the phocollage it is possible to obtain a general overview of the proposed interventions. It represents a section through the N4 road and how the different landscapes of the region come together in an integrated strategy.

Starting by the project of Moamba airport, the main focus is in the reallocation of the airport infrastructures that lead to a bigger scale development next to it. To complete this developments, there are strategies of guided occupation in some areas of the extension and a smaller scale contextualized development.

This new proposal needs to merge with the traditional areas that are currently in occupying the area and represent the identity of the country.

The strategy of sustainable industrialization as income generation source and job opportunity is proposed in the area of connection between Moamba airport and Matola, in relation to the industrial extension of Matola.

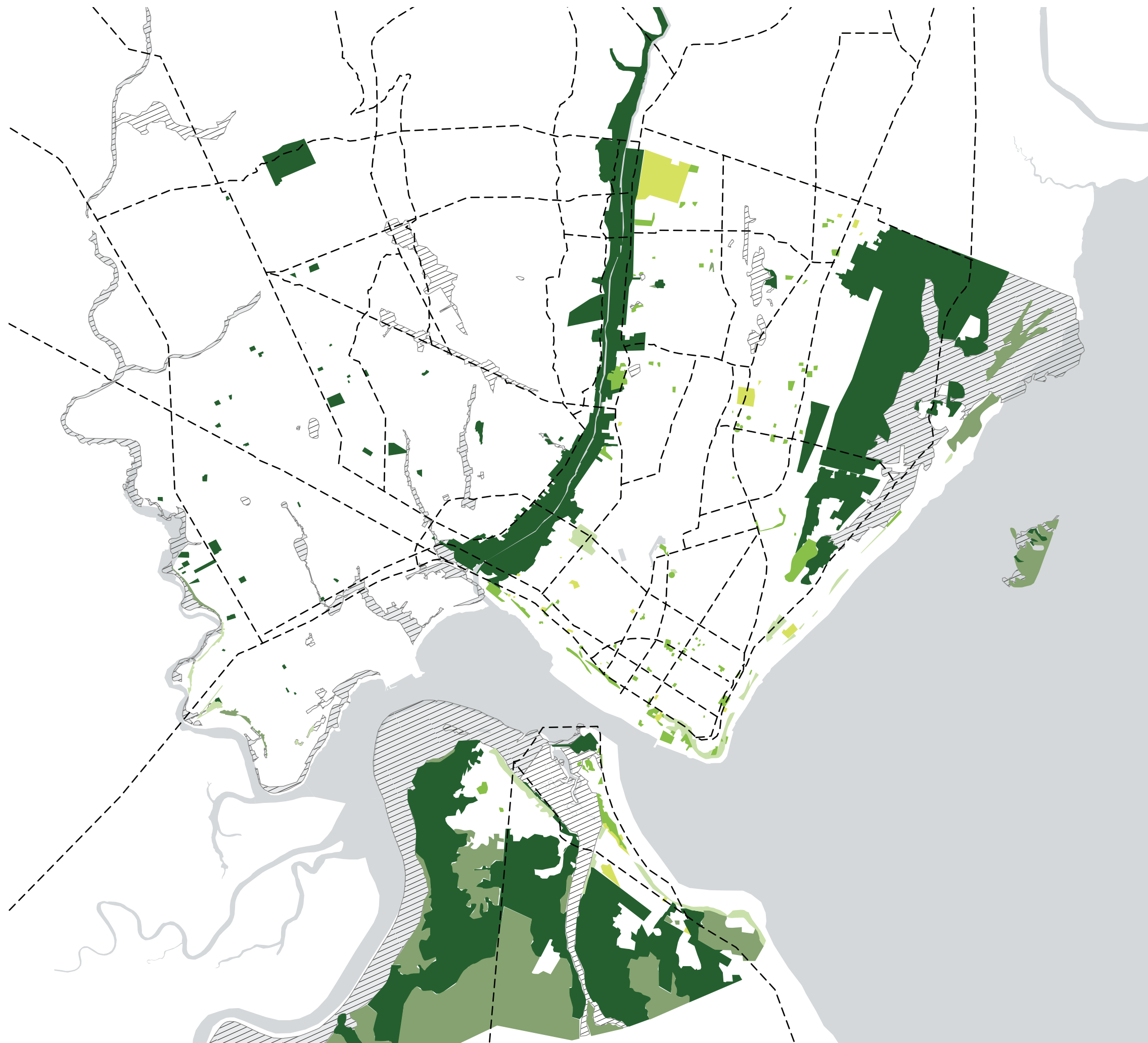
Next to it, the illustration shows the cities of Maputo and Matola in the back, to represent that it is the most urbanized area of the proposal. It frames the strategy of "The Corridors" where the different inclusively consolidated informal nodes can be perceived and their connections by public transport routes and a densification in the areas.

Once the new Katembe bridge is crossed, there is a higher presence of natural areas and the representation of the current typologies in Katembe. This is connected with new contextualized small scale developments and areas for guided occupation strategies. The development is connected to the reallocation of ministries to the other side of the bridge that will form the administrative core. At the end of the illustration the presence of natural reservoirs can be perceived and the diversity of animals and species.

This photocollage aims to give a general overview of the proposal. It does not represent a perfect section, it was adjusted to represent as much strategies as possible and the relation between them and with the context.

22.1
VISION 3MK-CBD
Moamba-Maputo-Matola-
Katembe
Context based development

Author: Concepción del Rocío Aranda Iglesias
Sources: mapped from confrontation of vision 1.0 with the different stakeholders interviewed in the fieldtrip. Simplification of the final strategy.
References:



LEYEND

- Main roads
- Protected natural spaces
- Urban green parks and gardens
- Natural green areas - bushes
- Agro-pecuary areas
- Flooding areas
- Eventual flooding areas
- Water



DESCRIPTION

There are several natural factors to be taken into account when proposing the new strategy for the area. Starting by the flooding areas that are currently being occupied by the residential sprawl or the plans currently proposed that locate in these areas new developments. These flooding areas should be treated with flooding control strategies and/or preservation laws.

At the same time, there are several natural spaces in need of being preserve from this urban sprawl. According to the location of new areas of expansion proposed by the latest urban plan of the municipalities, these areas will be used for residential programme. It is essential to preserve the current natural spaces as main touristic attractions and natural asset to the cities. In order to do so, in the strategy should be a programmatic reflection over these areas to enhance their use and value.

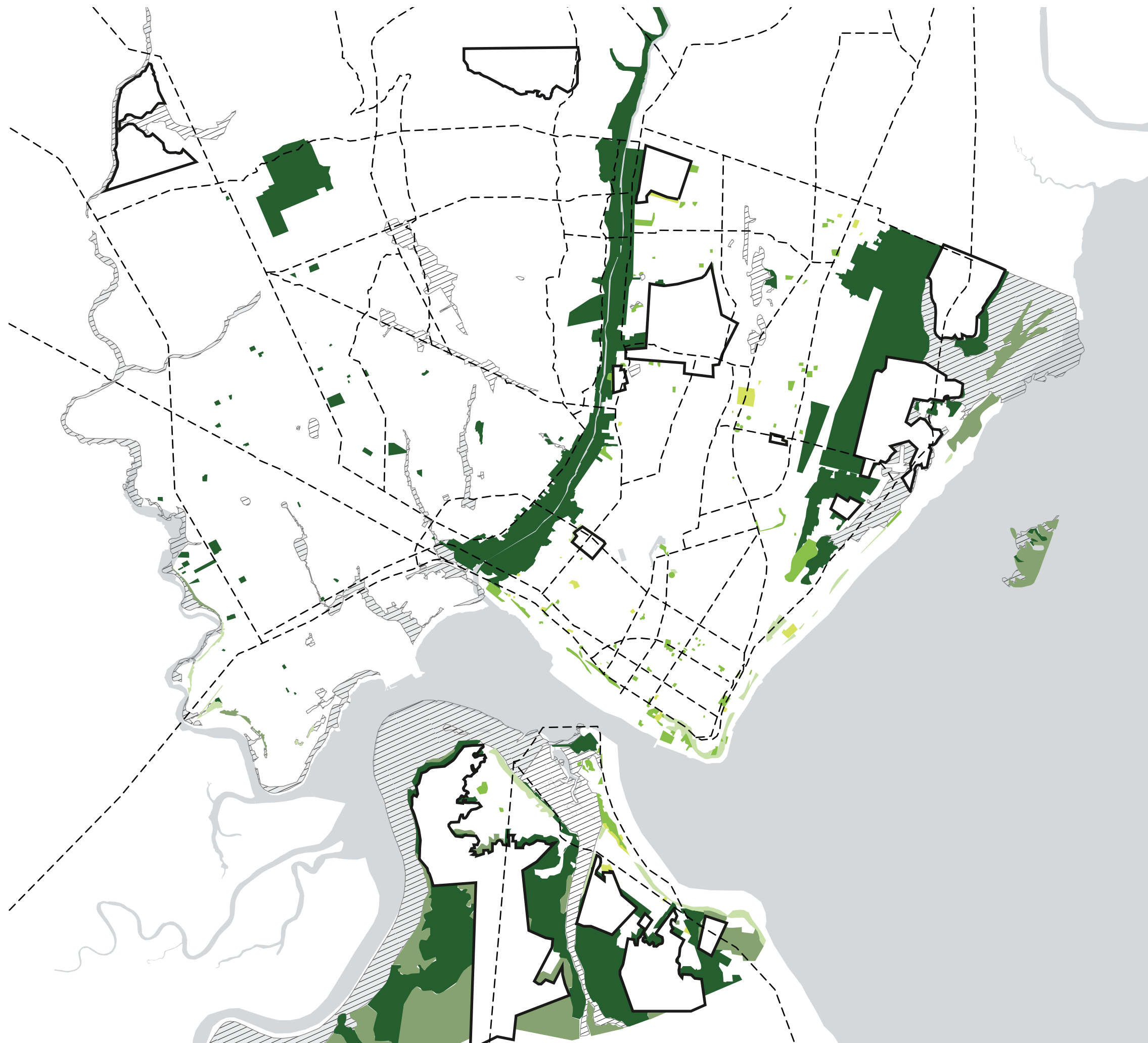
23

**SPATIAL INDICATORS OF
THE STRATEGY
F1 - NATURAL CONDITIONS
CURRENTLY**

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)

References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

- Main roads
- Protected natural spaces
- Urban green parks and gardens
- Natural green areas - bushes
- Agro-pecuary areas
- Flooding areas
- Eventual flooding areas
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DESCRIPTION

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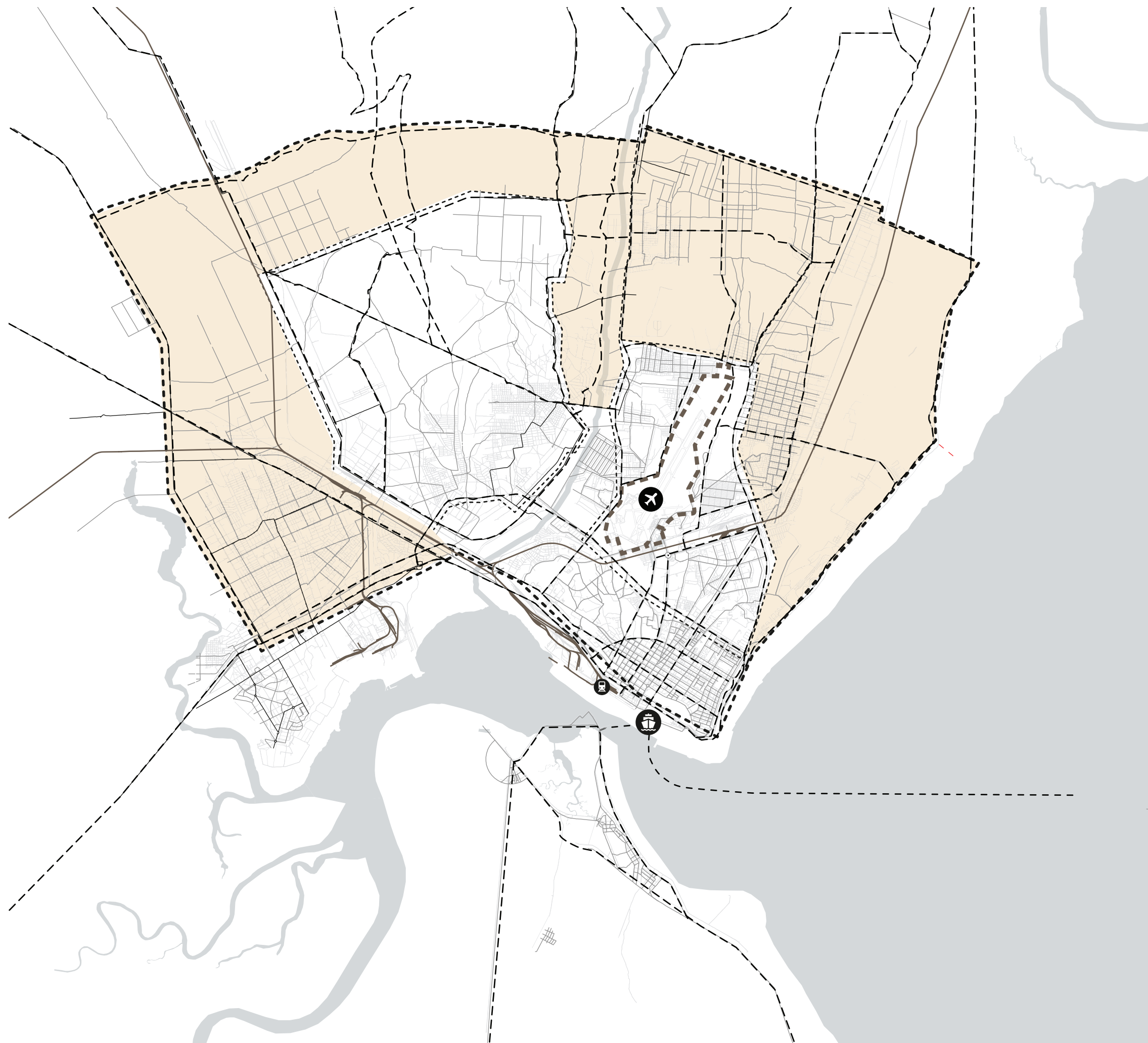
24

**SPATIAL INDICATORS OF
THE STRATEGY
F1 - NATURAL CONDITIONS
PLANNED**

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)

References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

- Main roads
- Secondary roads
- Local roads
- Railway
- New roads PEUMM
- Prioritary infrastructures
- Periphery areas
- Transport nodes
- Water
- Airport



DESCRIPTION

The mobility network function as a delimitation of the formal city and its separation of informal settlements. By the understanding of the circular roads, the peripheral areas of the city can be highlighted.

There is a multi-modality mobility layout that can be foster in the area by the connection of strategies regarding car, truck, train, boat and plane transport. If there is a common strategy to connect them, there are possibilities for internationalization and broader overview of the area from an exterior point of view.

However, the mobility nowadays is one of the main and biggest problematics of the MMA. It is essential to understand the current use of the general infrastructures network and create a realistic hierarchy among them with a renovation in phases to improve the connections and the conditions. There is a huge rate of mortality due to bad state of infrastructures in Maputo and Matola.

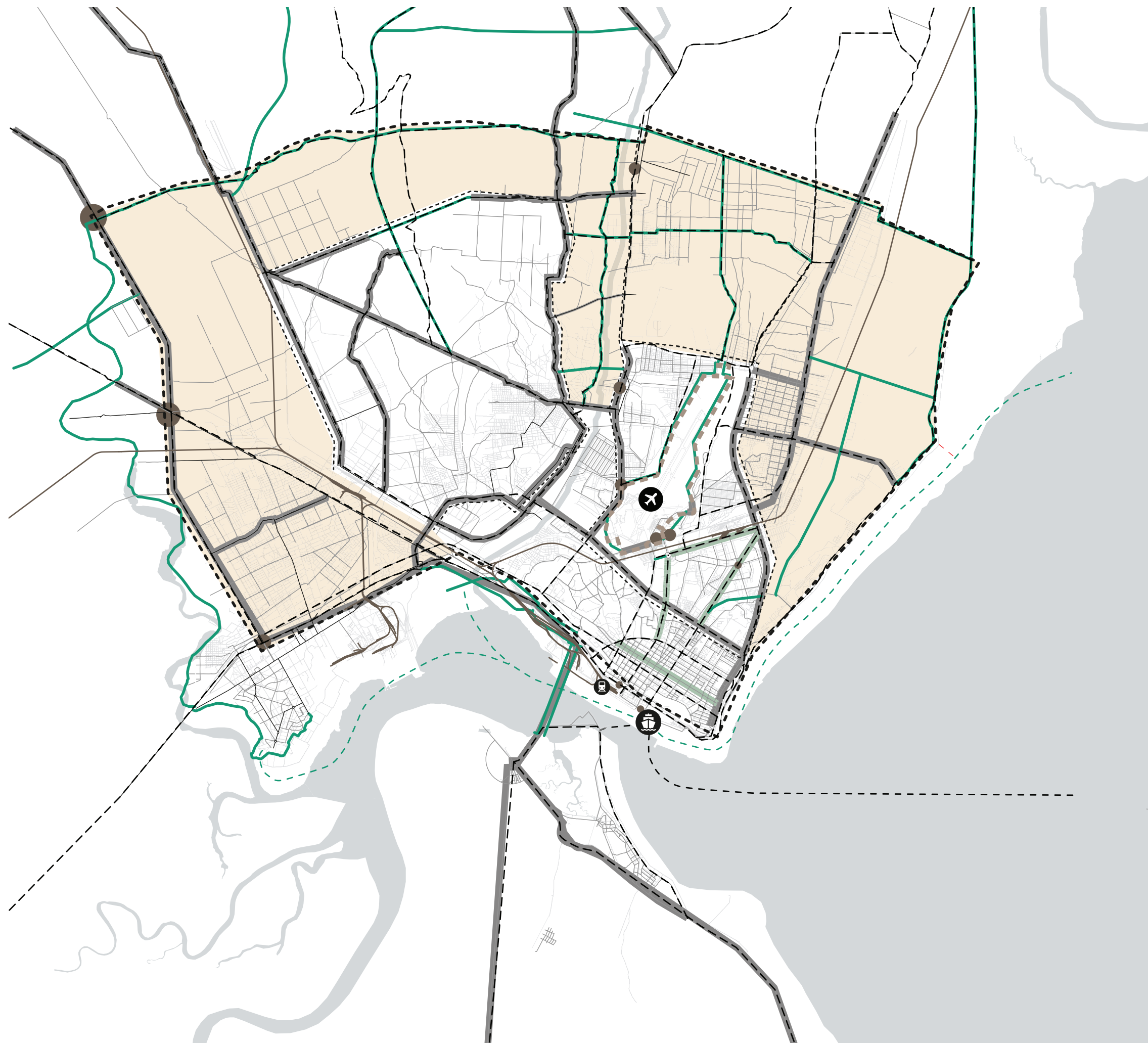
25

SPATIAL INDICATORS OF THE STRATEGY F2 - MOBILITY CURRENT

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)

References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

- Main roads
- Secondary roads
- Local roads
- Railway
- New roads PEUMM
- Priority infrastructures
- Periphery areas
- Transport nodes
- Water
- Airport



DESCRIPTION

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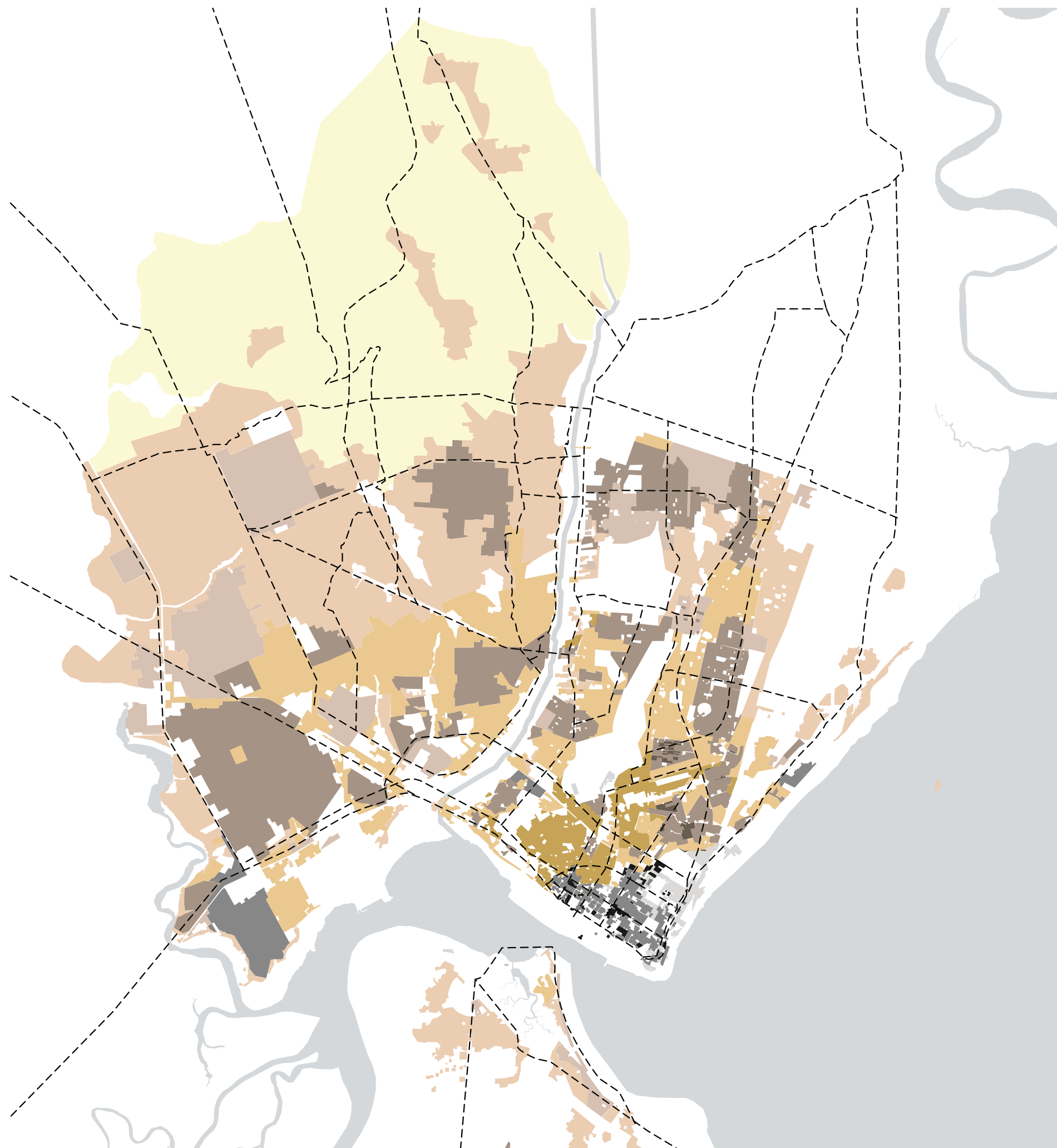
26

**SPATIAL INDICATORS OF
THE STRATEGY
F2 - MOBILITY
PLANNED**

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)

References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

----- Main roads

Consolidated residential areas

- Low density (<20hab/ha)
- Medium density
- High density (>60hab/ha)

Planned residential areas

- Low density (<20hab/ha)
- Medium density
- High density (>60hab/ha)

Non planned residential areas

- Not occupied
- Low density (<20hab/ha)
- Medium density
- High density (>60hab/ha)



DESCRIPTION

As illustrated in the maps, there is a predominance of informal non planned urban areas in the cities. In the PEUMM 2008, there is a proposal of formalizing part of it. However, little is explained about the methods of improvement.

This densification is related to the city centers and how it will evolve should clarify the new centers densification and be related to the infrastructures development. Something that is not clear in the proposal of PEUMM.

In order to densify, it is essential to propose new methods and study and understand the current densification initiatives happening in the peripheries.

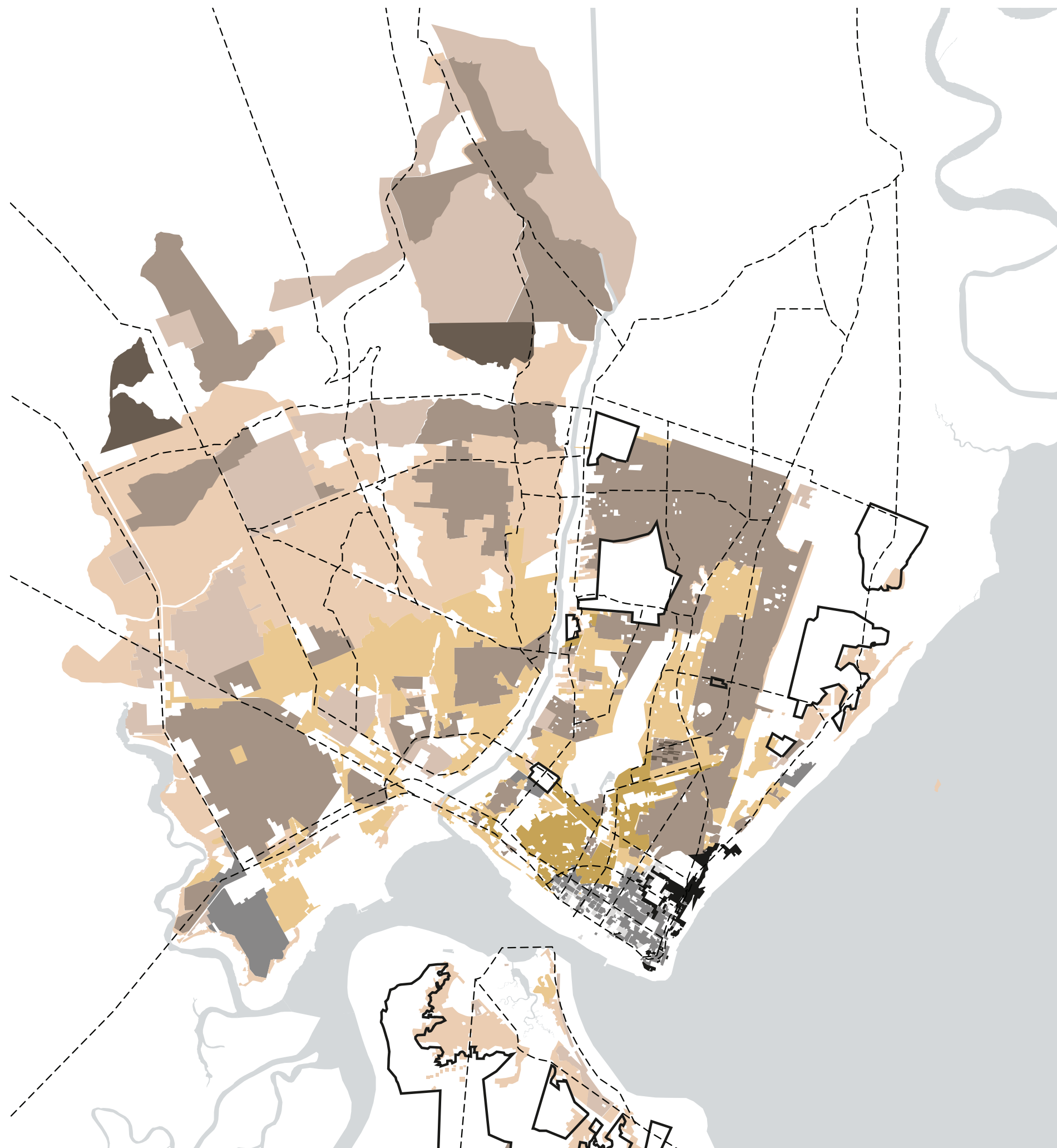
27

**SPATIAL INDICATORS OF
THE STRATEGY
F3 - DENSITY
CURRENT**

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)

References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

----- Main roads

Consolidated residential areas

- Low density (<20hab/ha)
- Medium density
- High density (>60hab/ha)

Planned residential areas

- Low density (<20hab/ha)
- Medium density
- High density (>60hab/ha)

Non planned residential areas

- Not occupied
- Low density (<20hab/ha)
- Medium density
- High density (>60hab/ha)



DESCRIPTION

As illustrated in the maps, there is a predominance of informal non planned urban areas in the cities. In the PEUMM 2008, there is a proposal of formalizing part of it. However, little is explained about the methods of improvement.

This densification is related to the city centers and how it will evolve should clarify the new centers densification and be related to the infrastructures development. Something that is not clear in the proposal of PEUMM.

In order to densify, it is essential to propose new methods and study and understand the current densification initiatives happening in the peripheries.

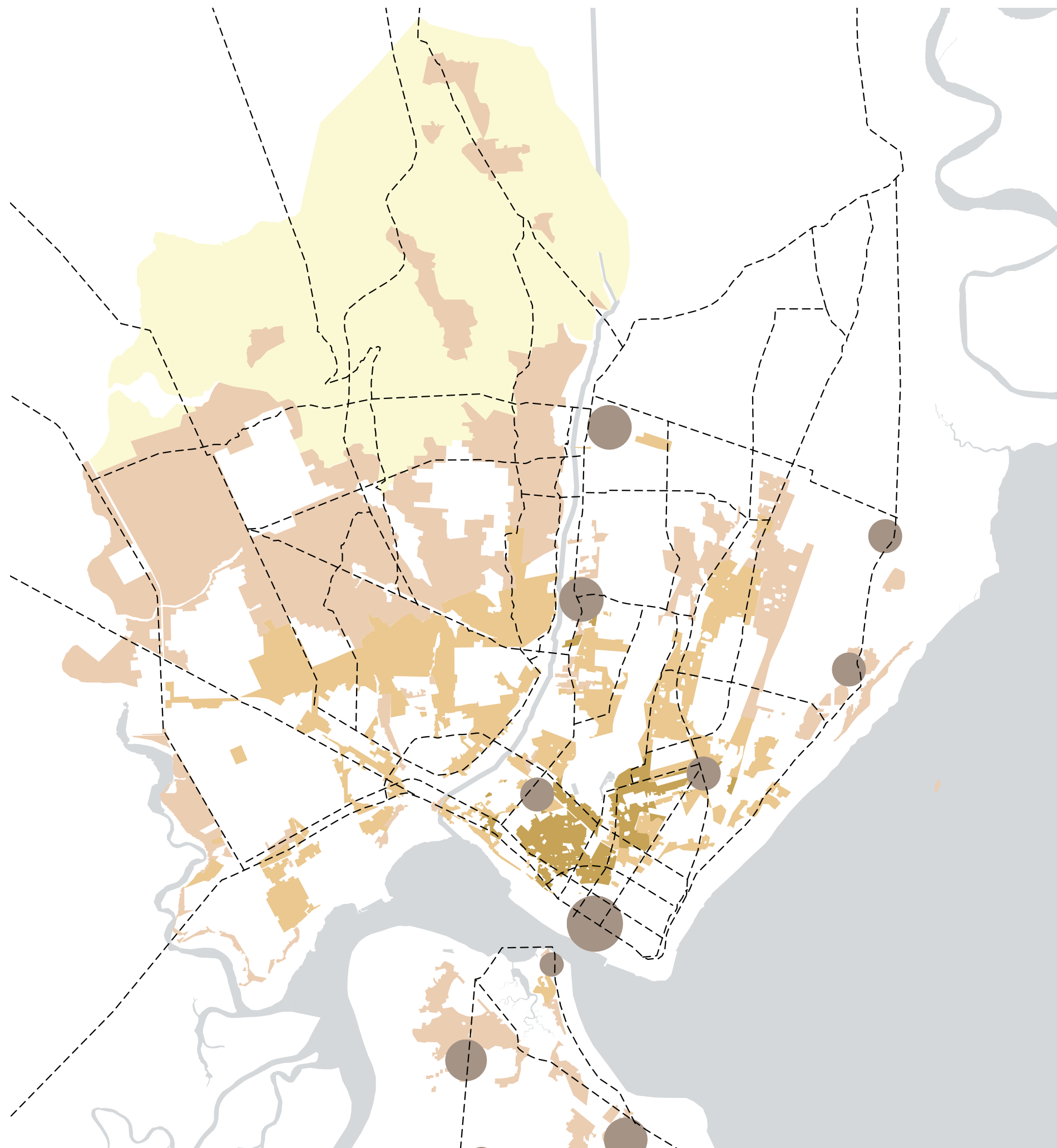
28

**SPATIAL INDICATORS OF
THE STRATEGY
F3 - DENSIFICATION
PLANNED**

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)

References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

----- Main roads

Consolidated residential areas

- Low density (<20hab/ha)
- Medium density
- High density (>60hab/ha)

Planned residential areas

- Low density (<20hab/ha)
- Medium density
- High density (>60hab/ha)

Non planned residential areas

- Not occupied
- Low density (<20hab/ha)
- Medium density
- High density (>60hab/ha)



DESCRIPTION

The informal economies are connected with the main roads of the cities. These connections are explained by the necessity of flows of people through the areas of informal markets and activities. These activities are being, since time ago, the main guide for expansion in MMA.

The informal economies follow the necessity of inhabitants to reach selling points closer to their living area.

At the same time, there are several market initiatives that understood the importance of the informality in the main cities. Therefore, some brands latest strategies divide the distribution between located shops and 'agents'. This agents are people that move around the city selling and specific product. This is the case of the latest ATM update: M-Pesa. An strategy in which it is possible to withdraw money from any shop or agent by just updating it in a phone app. Informal activities encourage flexibility and innovation. New ways of reaching those that are not following the rules of the formal city.

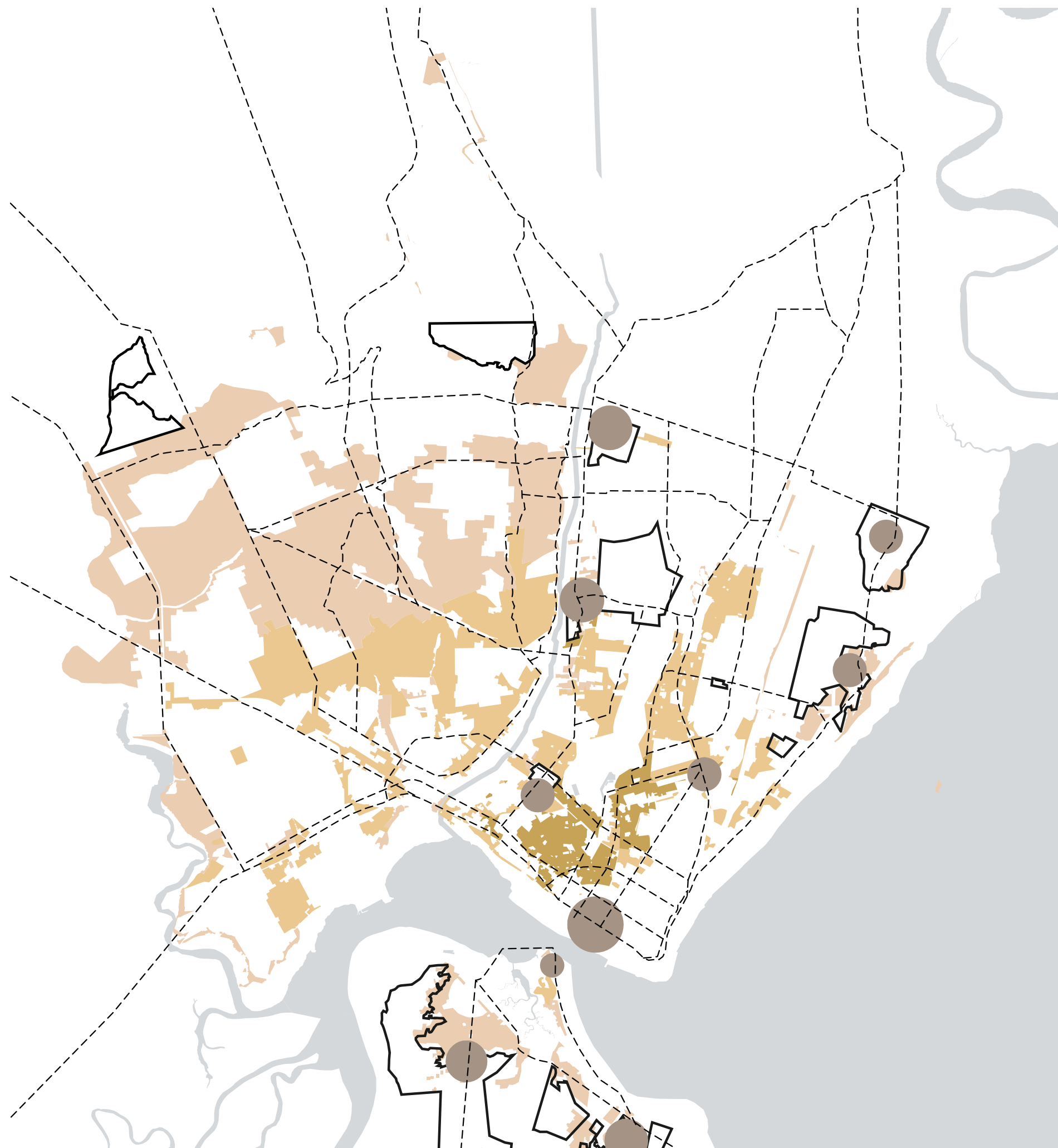
29

**SPATIAL INDICATORS OF
THE STRATEGY
F4 - INFORMAL ECONOMIES
CURRENT**

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)

References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

- Main roads
- Consolidated residential areas**
 - Low density (<20hab/ha)
 - Medium density
 - High density (>60hab/ha)
- Planned residential areas**
 - Low density (<20hab/ha)
 - Medium density
 - High density (>60hab/ha)
- Non planned residential areas**
 - Not occupied
 - Low density (<20hab/ha)
 - Medium density
 - High density (>60hab/ha)



DESCRIPTION

The informal economies are connected with the main roads of the cities. These connections are explained by the necessity of flows of people through the areas of informal markets and activities. These activities are being, since time ago, the main guide for expansion in MMA.

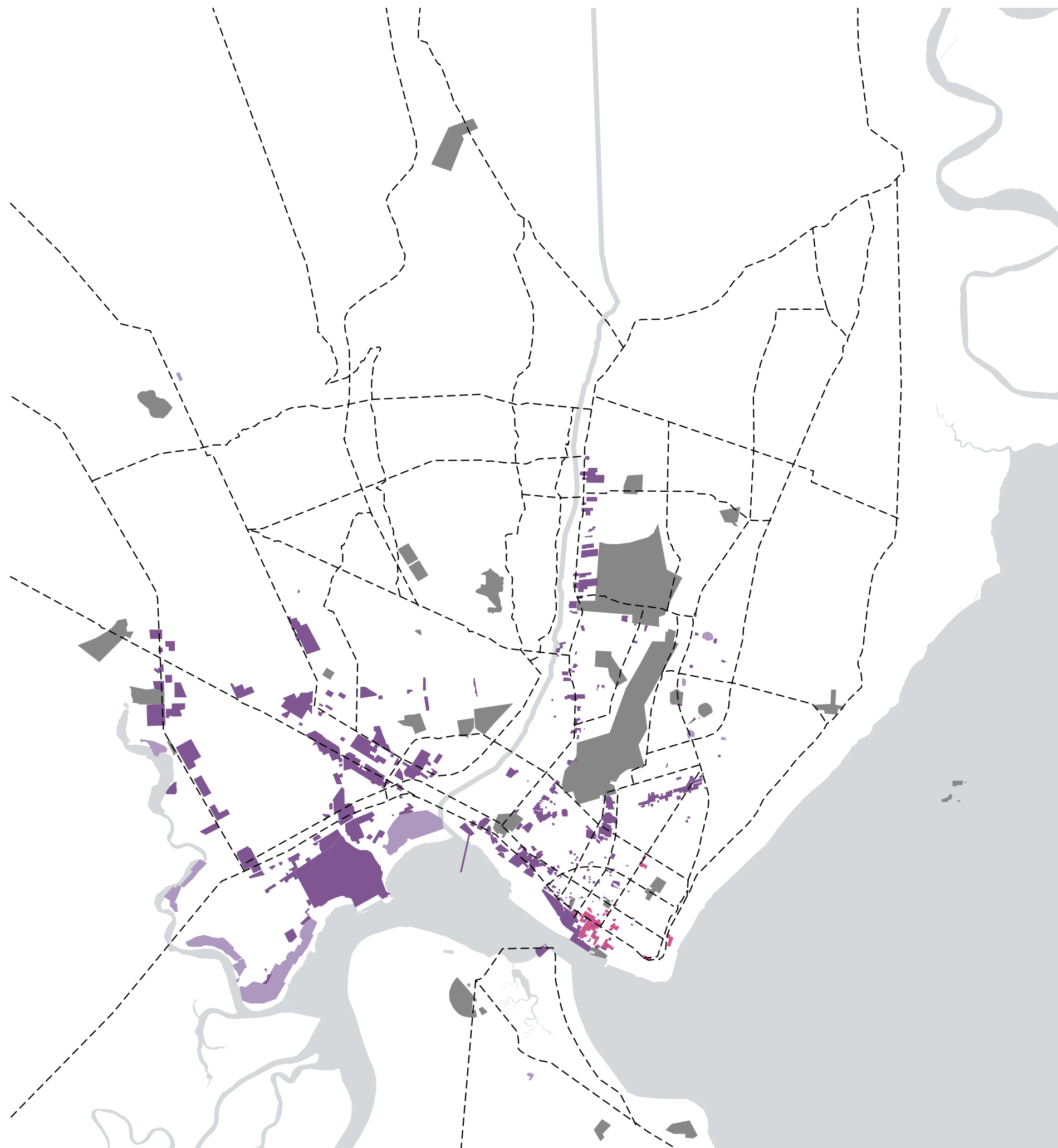
The informal economies follow the necessity of inhabitants to reach selling points closer to their living area.

At the same time, there are several market initiatives that understood the importance of the informality in the main cities. Therefore, some brands latest strategies divide the distribution between located shops and 'agents'. This agents are people that move around the city selling and specific product. This is the case of the latest ATM update: M-Pesa. An strategy in which it is possible to withdraw money from any shop or agent by just updating it in a phone app. Informal activities encourage flexibility and innovation. New ways of reaching those that are not following the rules of the formal city.

30

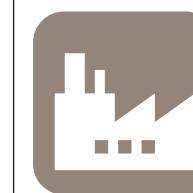
**SPATIAL INDICATORS OF
THE STRATEGY
F4 - INFORMAL ECONOMIES
PLANNED**

Author: Concepción del Rocío Aranda Iglesias
Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)
References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

- Main roads
- Extracting industry
- Stock and maintenance industry
- Areas for industrial parks
- Multifunctional areas
- Special uses areas



DESCRIPTION

The industry is the main formal economical sector in Mozambique. Specially connected to railway and maritime routes, it is essential for the mobility strategy in a broader picture of MMA.

In the plans proposed from the municipalities, there is a strong presence of multifunctional spaces and areas that will be dedicated to technological parks and industrial areas in the future. Therefore, there is a planning of industrial development of the areas. Something that is supported by the national development strategy of Mozambique.

As explained in the section of policies study, the industrialization process is linked to the improvement of main roads and train rails to reduce the trucks traffic and trains overflows.

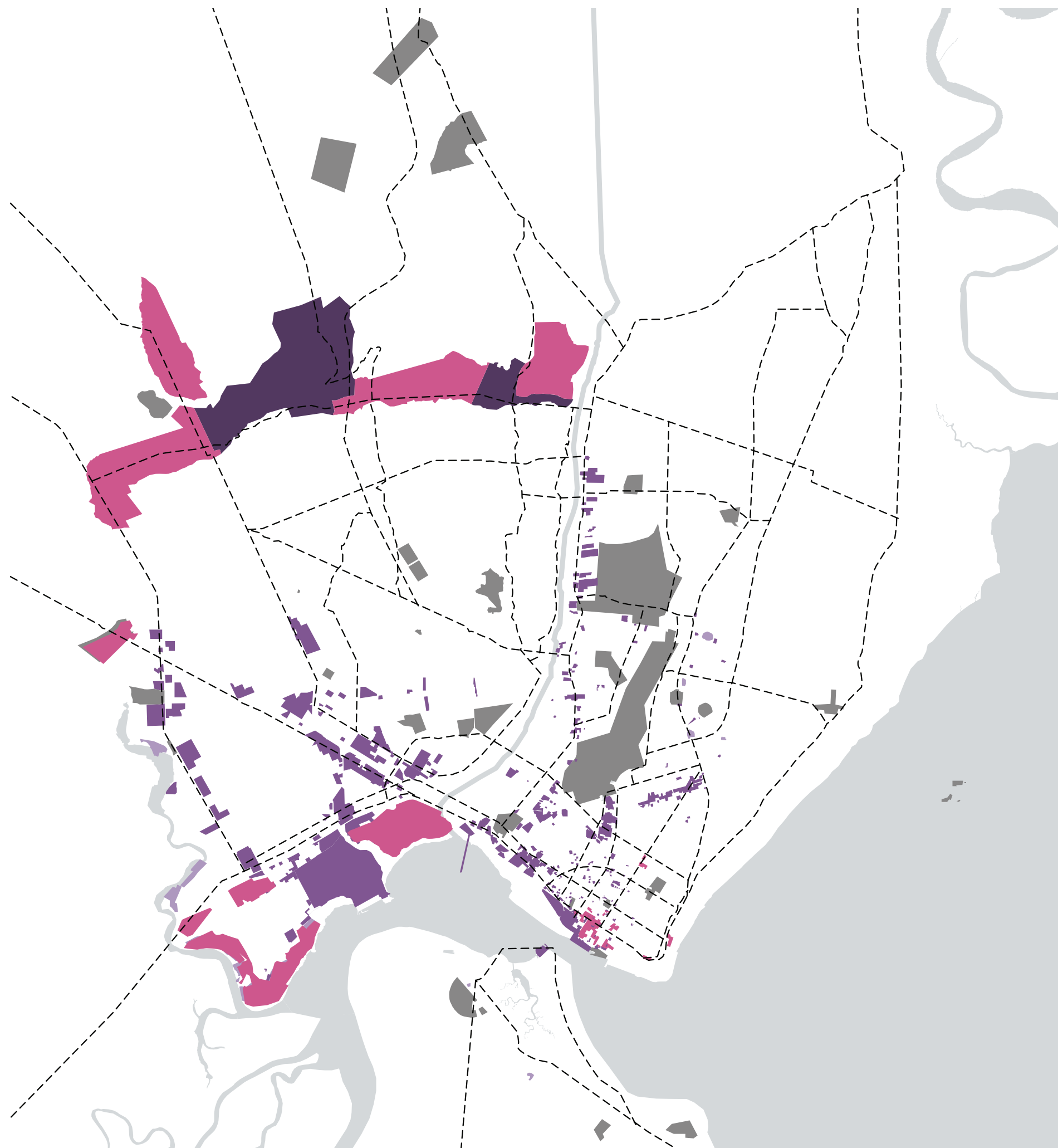
31

**SPATIAL INDICATORS OF
THE STRATEGY
F5 - INDUSTRY
CURRENT**

Author: Concepción del Rocío Aranda Iglesias

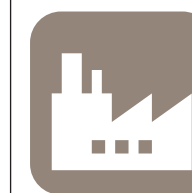
Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)

References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

- Main roads
- Extracting industry
- Stock and maintenance industry
- Areas for industrial parks
- Multifunctional areas
- Special uses areas



DESCRIPTION

The industry is the main formal economical sector in Mozambique. Specially connected to railway and maritime routes, it is essential for the mobility strategy in a broader picture of MMA.

In the plans proposed from the municipalities, there is a strong presence of multifunctional spaces and areas that will be dedicated to technological parks and industrial areas in the future. Therefore, there is a planning of industrial development of the areas. Something that is supported by the national development strategy of Mozambique.

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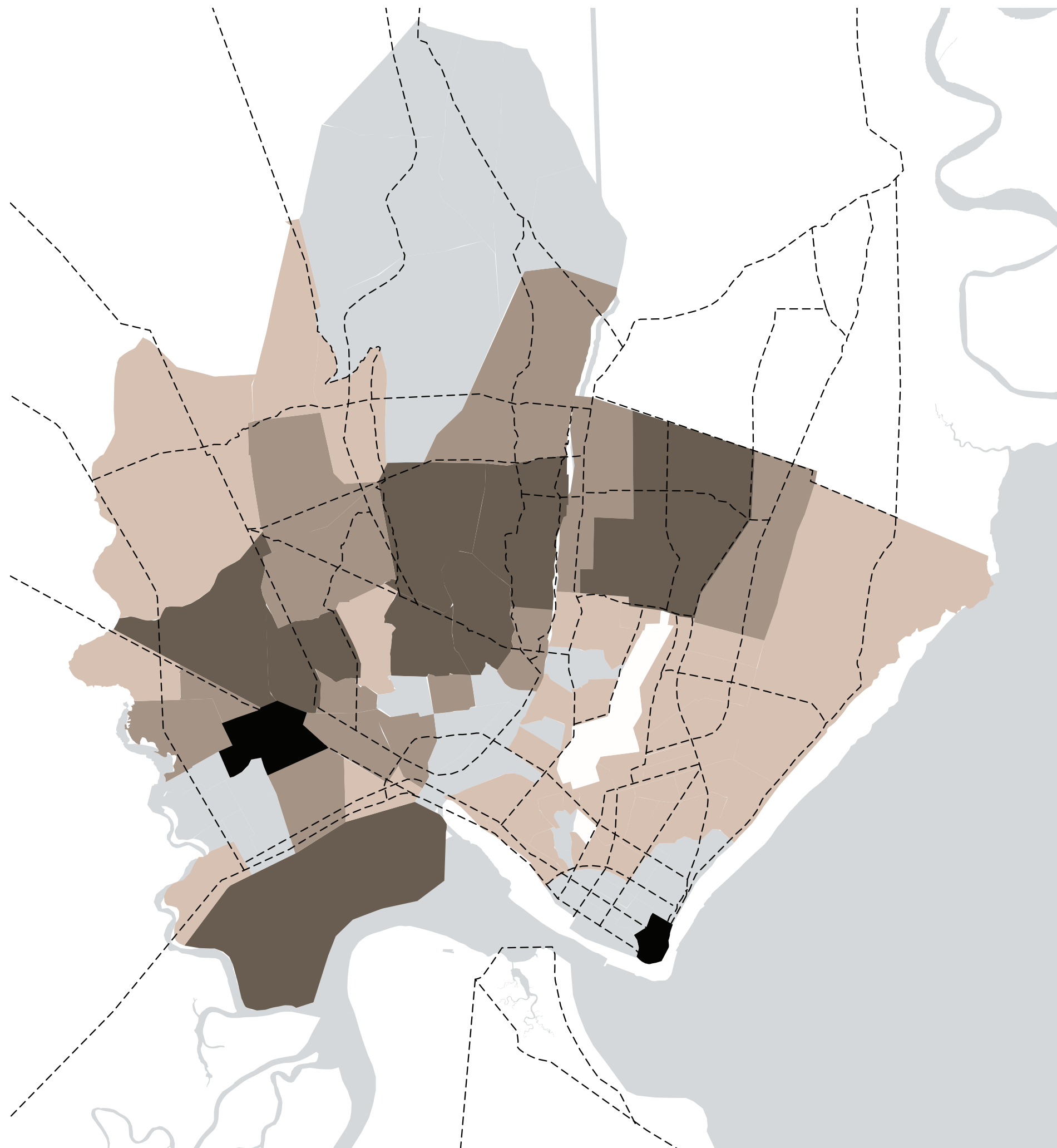
32

**SPATIAL INDICATORS OF
THE STRATEGY
F5 - INDUSTRY
PLANNED**

Author: Concepción del Rocío Aranda Iglesias

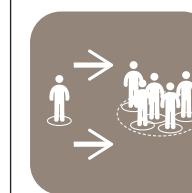
Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)

References: Google maps and google earth, to compare the data obtained with the current reality of the area.



LEYEND

- Main roads
- Strong decrease of people
- Soft decrease of people
- Soft increase of people
- Medium increase of people
- Strong increase of people



DESCRIPTION

The growth of the MMA registers its highest rates in the peripheral areas. The residential areas related to the current city centers present high rental prices and, due to the public ownership of the registered land, there are several difficulties to make this change.

Therefore, the population have been forced to find empty land to occupy in the pripheries of the cities, leading to a prawl trend based on low density and precarious living conditions. Apart from this, the growth is not supported by infrastructures, which worse the living conditions by the lack of proper connections.

Finally, there is a strong connection between the growth and the lack of job opportunities. The main formal jobs are in the city centers, which supposse a barrier for those living in the farthest peripheries. They do not have access to the formal city and need to find jobs in the informal economies that work as centers in the middle distance.

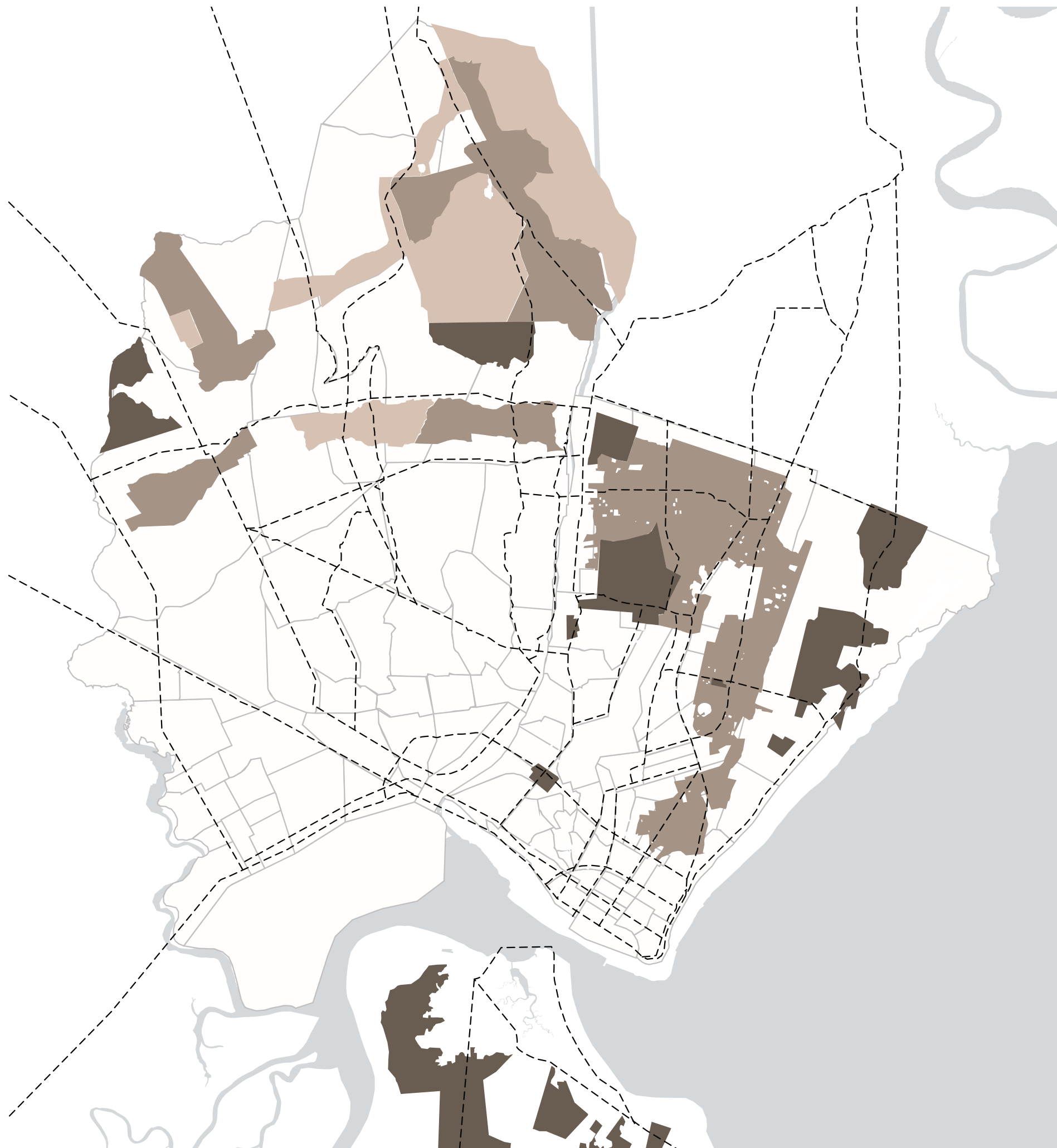
33

**SPATIAL INDICATORS OF
THE STRATEGY
F6 - GROWTH
CURRENT**

Author: Concepción del Rocío Aranda Iglesias

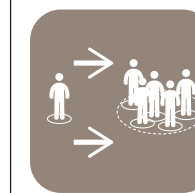
Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)

References: Google maps and google earth, to compare the data obtained with the current reality of the area.
Mozambique, I. (2012). Projeccoes anuais da população total, urbana e rural, dos distritos da cidade de Maputo 2007-2040.



LEYEND

- Main roads
- Strong decrease of people
- Soft decrease of people
- Soft increase of people
- Medium increase of people
- Strong increase of people



DESCRIPTION

The growth of the MMA registers its highest rates in the peripheral areas. The residential areas related to the current city centers present high rental prices and, due to the public ownership of the registered land, there are several difficulties to make this change.

Therefore, the population have been forced to find empty land to occupy in the pripheries of the cities, leading to a prawl trend based on low density and precarious living conditions. Apart from this, the growth is not supported by infrastructures, which worse the living conditions by the lack of proper connections.

Finally, there is a strong connection between the growth and the lack of job opportunities. The main formal jobs are in the city centers, which supposse a barrier for those living in the farthest peripheries. They do not have access to the formal city and need to find jobs in the informal economies that work as centers in the middle distance.

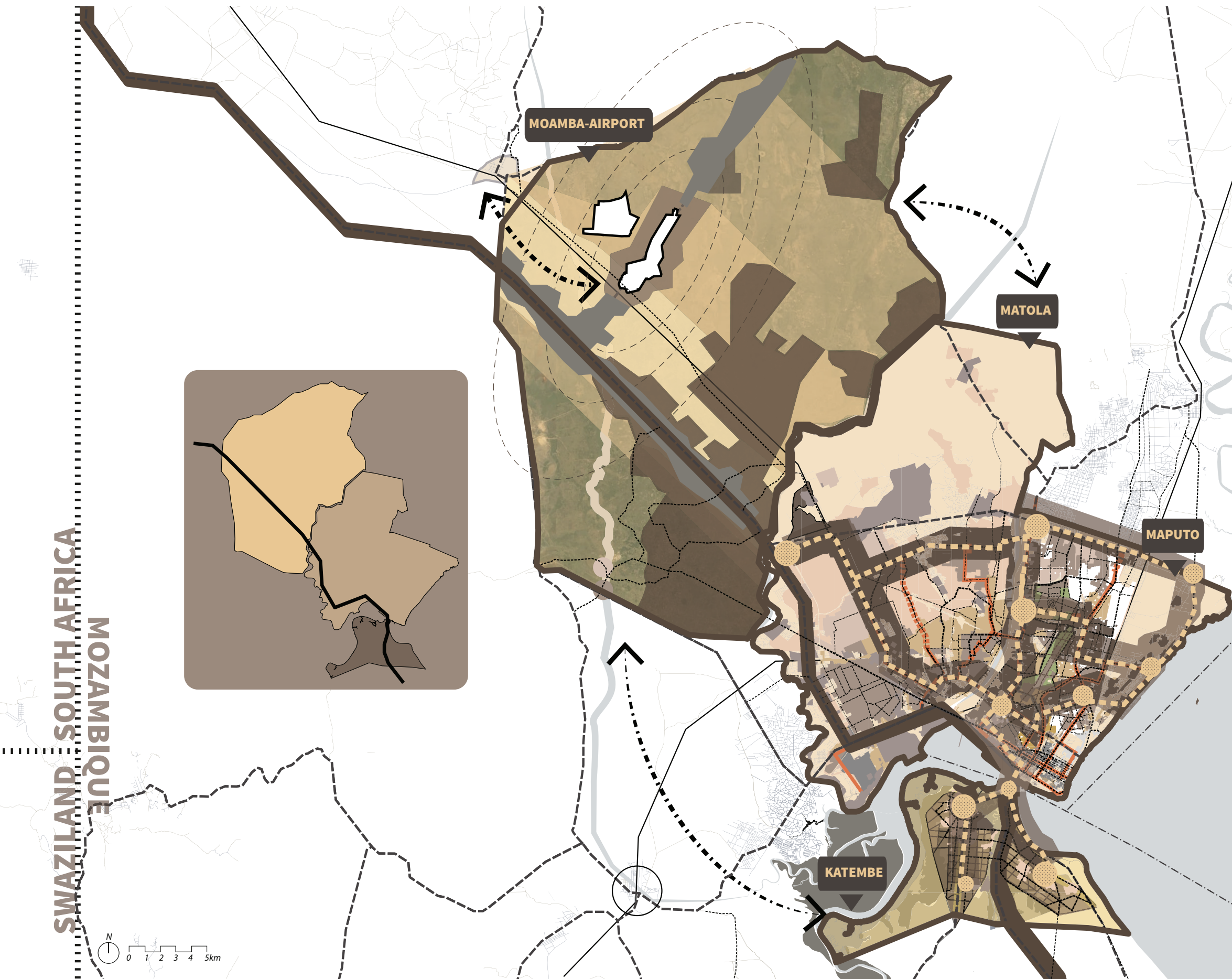
34

**SPATIAL INDICATORS OF
THE STRATEGY
F6 - GROWTH
PLANNED**

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)

References: Google maps and google earth, to compare the data obtained with the current reality of the area.
Mozambique, I. (2012). Projeccoes anuais da população total, urbana e rural, dos distritos da cidade de Maputo 2007-2040.





LEYEND

- Main infrastructures
 - Secondary roads
 - Tertiary roads
 - Railway
 - Extension public transport-proposed
 - Public transport (chapa) lines
 - Corridors connections
 - Corridor nodes
 - Corridor densification extension
 - Prioritary areas to be densifies
- | NON PLANNED | PLANNED |
|------------------|------------------|
| ● not urbanized | ● low density |
| ● low density | ● middle density |
| ● middle density | ● high density |
| ● high density | |
- Extension limits - programmed natural spaces

DESCRIPTION

Strategy in city scale that present the concept of corridor applied to the context of MMA, the direct application of a mobility theory in the specific case of the context of Mozambique.

A rethinking of what corridor suppose for the 70% of the population living in the informal cities of Maputo and Matola. Its aim is to highlight the reality of the cities and propose a first step for urban densification in prioritary areas.

The corridor in MMA, following the current city dymanics, is defined by the connection of informal economy nodes via public transportation. This project aim to discover the second face of the cities, the informal one, that supposes the representation of 70% of Maputo and Matola inhabitants. It introduces growth by the densification of the priority areas defined by 1km extension next to the corridors. There is an identification of the current low and middle density areas in MMA, with a highlight of those inside the priority areas. At the same time, there is an identification of the current chapa¹ routes in the map² and a proposition of relation of them with the designed connections between the informal nodes identified.

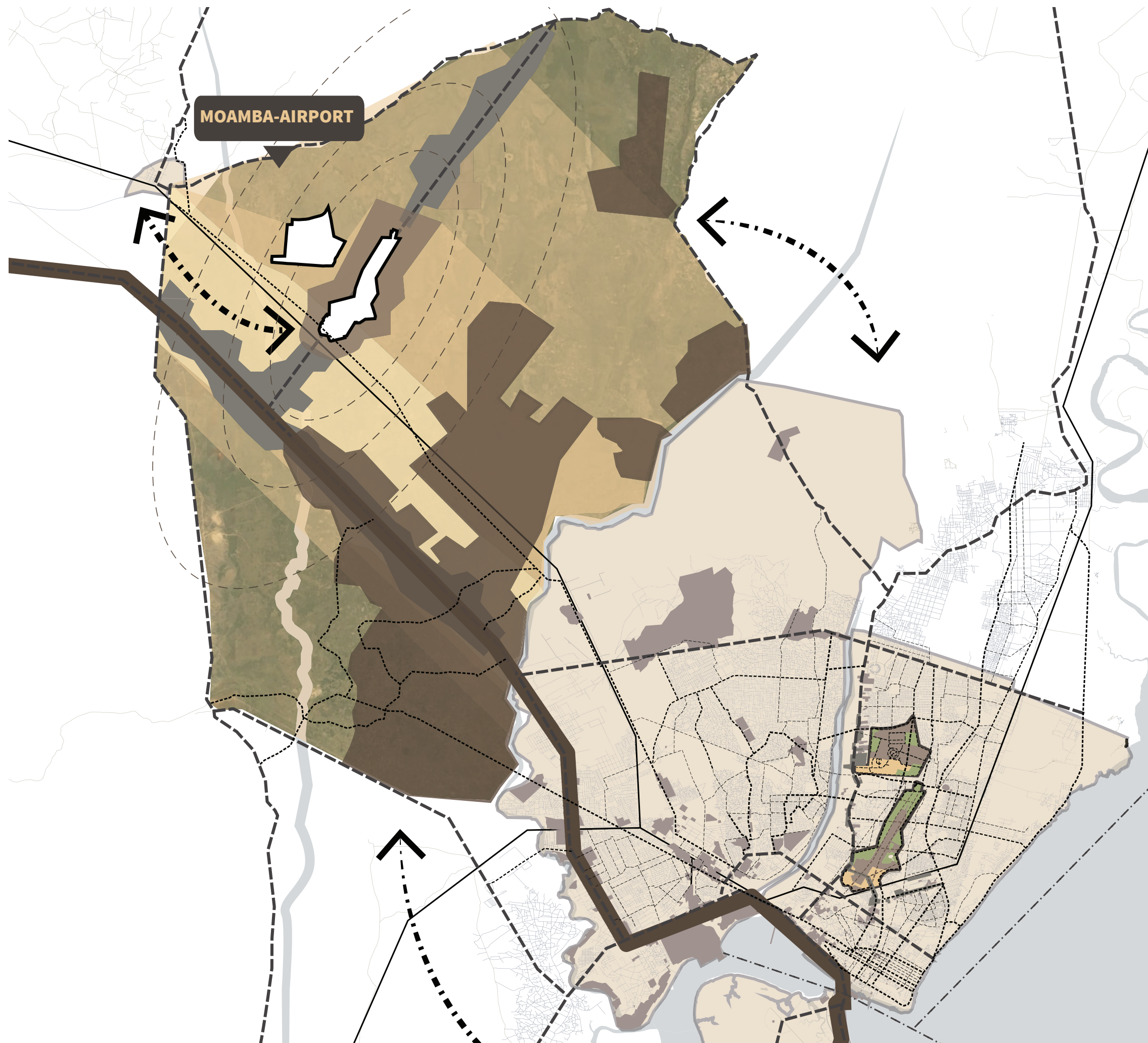
36

**STRATEGY MEDIUM SCALE.
THE CORRIDORS**

Author: Concepción del Rocío Aranda Iglesias

Sources: spatial factors for the strategy

References: masterplan for Johannesburg; Todes, A. (2012). Urban growth and strategic spatial planning in Johannesburg, South Africa. CITIES, 29, 158-165.



LEYEND

- Current urbanized areas in Moamba airport
- Moamba airport new development area
- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Industrial areas
- Surrounding cities
- N4. Main connection S. A - MZ
- Main roads
- Secondary roads
- Tertiary roads
- Railway
- Maritime routes

DESCRIPTION

Strategy in Metropolitan scale related to enhance the relation between Mozambique and South Africa by moving the airport to a middle point, next to the current city of Moamba.

The moving of the airport next to the city of Moamba will change the dynamics of the MMA in terms of economic interests, development and public transport. By increasing the attention in Moamba, there will be a diminishing on the city centers pressure and a new development focus.

The proposal integrates the current layer of urbanization by proposing a densification of the current urban areas¹ in between Moamba and Matola.

At the same time, when approaching the development of the new airport urban extension, there is a proposal of an urbanization in phases.

Finally, the change in the metropolitan dynamic will lead to an increase of traffic and mobility in a multi-modality level with an extension of railway flows, maritime routes and port facilities and development of new roads and maintaining of the current ones².

37

STRATEGY LARGE SCALE. MOAMBA AIRPORT

Author: Concepción del Rocío Aranda Iglesias

Sources: spatial factors for the strategy

References: interviews with stakeholders about Maputo airport and Moamba airport strategy

Image xx. Maputo International Airport orthophoto
Source: Google earth



LEYEND

- Proposed special activities
- Residential areas
- Green areas
- Industrial strip
- Current commercial activities
- Main roads
- Secondary roads
- Tertiary roads
- Proposed connections

DESCRIPTION

Currently, the Maputo International airport act as an attraction of a daily flow of people, which suppose an attraction for the people that live surrounding it and work in relation to this flow: selling goods in the roads or carrying luggage in the airport door. Therefore, the strategy seeks the creation of a different focus of attraction in the area by the reutilization of the current airport facilities. After an analysis of some of the future visions for the city, there are propositions of creating new university campus, technological parks or industrial parks. In any case, the existence of a new focus that entails a daily flux of population. Due to its location, there is scope for preserving part of the current natural landscapes inside the airport limit, to increase the green areas in the neighbourhoods surrounding the airport which currently present a majority of informal characteristics. In the same way, the current airport facilities create a barrier in the connection East - West in the city of Maputo, there is scope for reconnecting the neighbourhoods at both sides of the airport by creating new infrastructures.

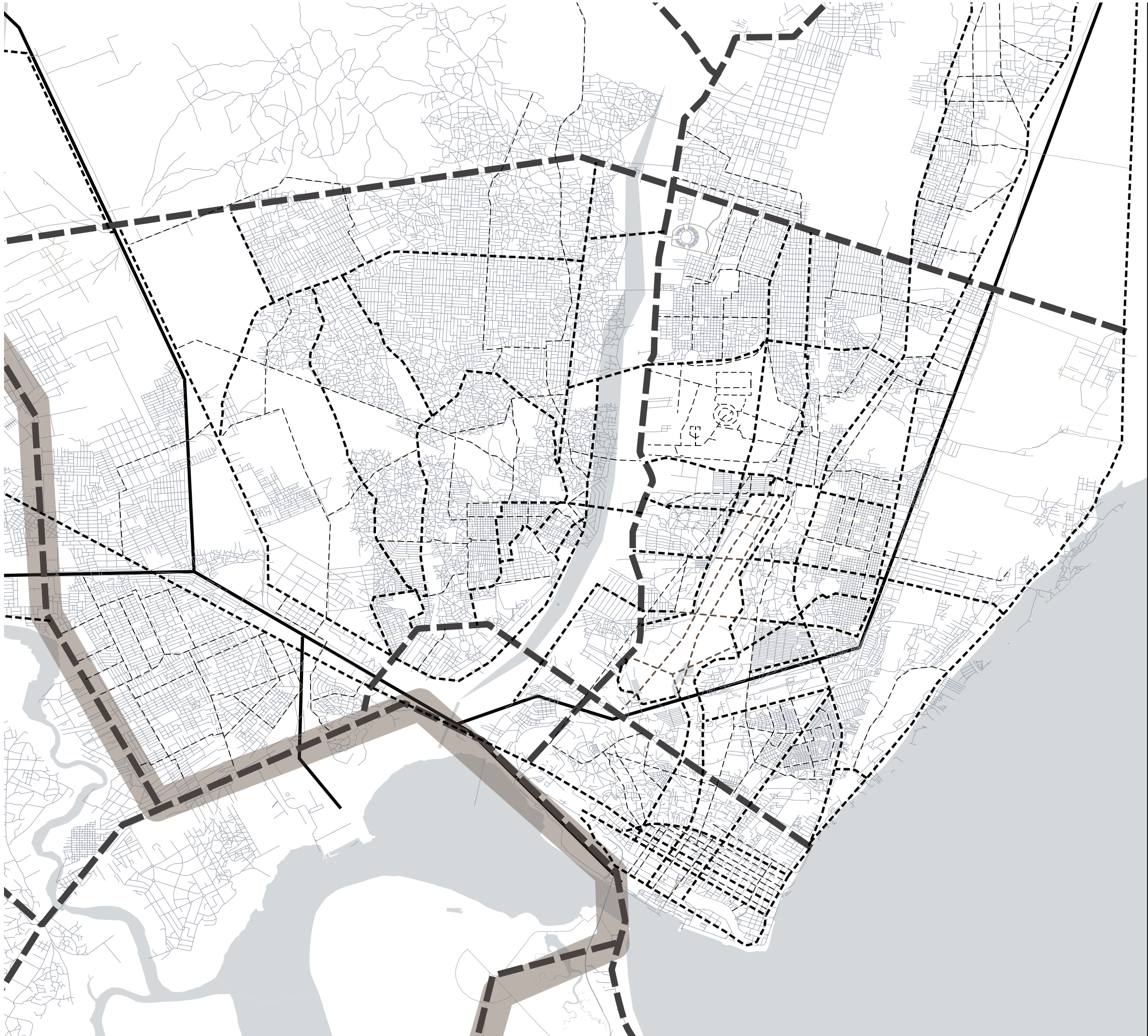
38

STRATEGY SHORT SCALE.
MAPUTO INTERNATIONAL
AIRPORT

Author: Concepción del Rocío Aranda Iglesias

Sources: google earth images

References: interviews with stakeholders about Maputo airport and Moamba airport strategy



LEYEND

- N4. Main connection S. A - MZ
- Main roads
- Secondary roads
- Tertiary roads
- Railway
- Maritime routes

DESCRIPTION

During the sessions with stakeholders in the fieldtrip there were several discussions about the precarious situation of the mobility system nowadays and the major traffic situations that take place in a daily basis in the main roads, especially in the routes of connection with ports with high presence of trucks.

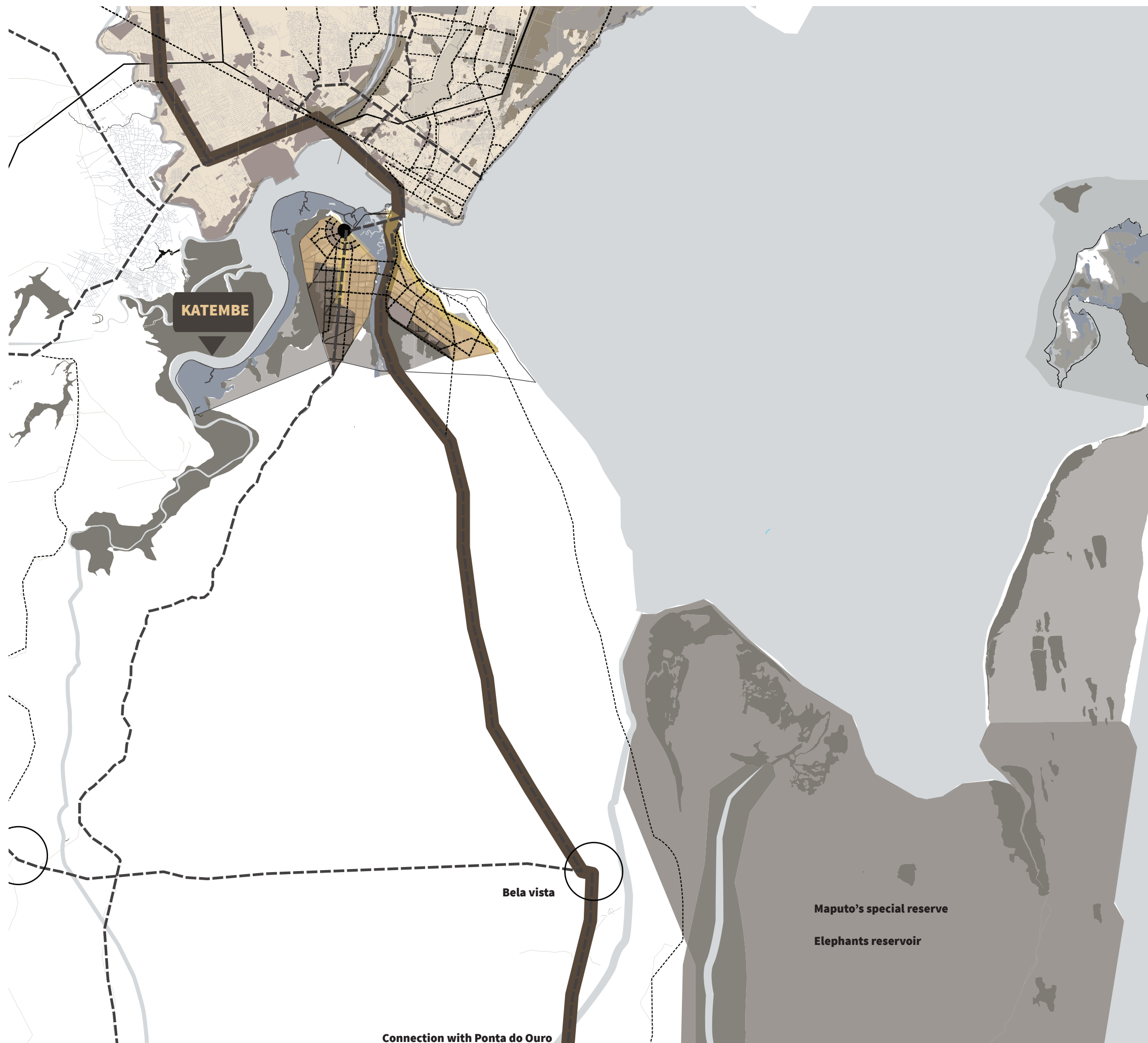
At the same time, there were several academics proposing an approach were the strategy was directed towards the organization of the current infrastructure system instead of the planning and construction of the roads.

Within this new hierarchy of roads, there is scope for introducing a vision for the expansion of the traffic flows by maritime, railway or truck routes. It is essential to organize the multi-modality opportunity of the area and create a combined strategy that upgrade the MMA into an accessible position in the international sphere.

39

STRATEGY MEDIUM SCALE.
HIERARCHY OF ROADS

Author: Concepción del Rocío Aranda Iglesias
Sources: map 04. layer analysis. layer 3. mobility
References: GIS data from Open Street map & Masterplan 2008 of Maputo and Matola Municipalities. (PEUMM 2008)



LEYEND

- Planned urbanization areas by Municipality
- Reduction proposal
- Prioritary areas of development
- Natural reservoirs
- Maputo's special reserve
- Agro-pecuary areas
- N4. Main connection S. A - MZ
- Main roads
- Secondary roads
- Tertiary roads
- Railway
- Maritime routes
- Natural base - water bodies
- Flooding areas
- Katembe proposed center
- City centers

DESCRIPTION

Strategy in Metropolitan scale related to the urban development of the MMA, especially Maputo area to the district of Katembe. The development is possible due to the construction of a bridge between Katembe area and the city center of Maputo, which enhance the connections and open a new variety of possibilities in the area.

The strategy of New Katembe is based on the proposed development plan for the area that will be implemented as soon as the Katembe bridge is finished. The strategy evaluates the current plan and proposes some changes to adjust the general idea to the context of Mozambique. The main principles of readjustments are related to the preservation of natural spaces, the organization of a hierarchy with a center and secondary areas, the adaptation to human scales, the respect to the current urbanization layer and the introduction of some flexibility for the occupation of land by part of the population with low income.

40

**STRATEGY LARGE SCALE.
NEW KATEMBE**

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map. PEUMM catembe information

References: Maputo Municipality, T., Betar, G., & Maputo Sul, E. (2017). A nova Katembe - Uma cidade para o futuro.



DESCRIPTION

The current urban plan proposed for Katembe in the close future presents several interesting qualities:

- Connectivity improvement with Ponta do Ouro
- New connection with South Africa through the N4
- Rapid access to Maputo through the bridge
- Basic infrastructure dotation for the area
- Aim for a proper urban planning
- Acknowledgement of the touristic potential of the area
- Phasing approach
- Extension of the Katembe port linked to Maputo port

However, there are several aspects that could be interesting to include in the proposal. These have been added to the evaluation map although further research must be conducted to propose a final urban plan for the idea:

- Respect the current natural spaces, as reflected in the core interventions of the general strategy.

- Represent the dynamics of the area with the hierarchy of roads and the creation of a city center.

- Include as an active part the current population of Katembe. In the decision process and the spatial design of the plan.

- Increase the touristic potential of the area by the use of natural spaces and the urbanization related to the coasts and the maritime port.

- Incentive the industry in relation with the new connections but locating them in areas where the natural spaces can not be damaged.

- Reduce the scale of intervention by prioritizing the public transport which demand higher densities (keeping the 4 floors height maximum to prevent the necessity of elevators that require maintenance).

- Understand the informal trend of urbanization that guided the urban development of Maputo and Matola and propose areas preserved where a guided occupation can take place. As well as facilitate spaces for informal economy activities. "The Corridors" strategy might be applied in the area of Katembe as well when the informal growth of the city take place. Under the approach of guided occupation (explained in the previous section J.5) there is scope for separating the informal city from precarious living conditions and introducing a new way of development.

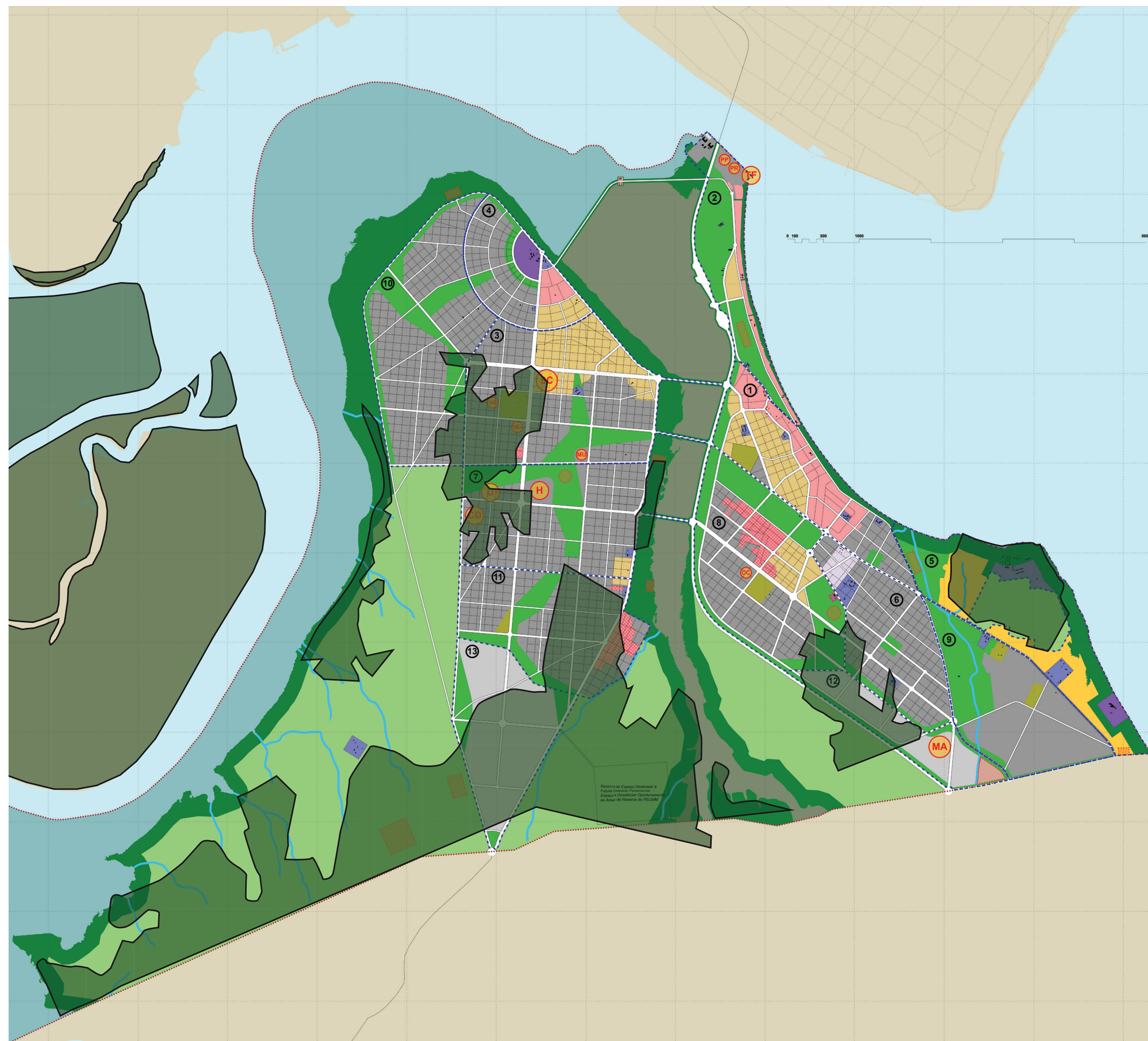
41

STRATEGY MEDIUM SCALE. NEW KATEMBE PLAN EVALUATION

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map. PEUMM catembe information

References: Maputo Municipality, T., Betar, G., & Maputo Sul, E. (2017). A nova Katembe - Uma cidade para o futuro.



LEYEND

- Current natural areas
- Flooding areas
- Possible flooding areas
- Protection areas
- Agro-pecuary areas
- Structural green areas
- Specific use green areas
- Protected water
- Special uses
- Special uses to maintain
- Infrastructure equipment areas
- Colective equipments areas
- Urban expansion areas
- Urban land to consolidate
- Implemented areas from current plans
- Urban land to reorganize
- Industrial and logistic activities
- Touristic activities
- Very High density limit (190 hab/ha)
- High density limit (179 hab/ha)
- Medium density limit (108 hab/ha)
- Low density limit (49 hab/ha)

DESCRIPTION

This map aims to highlight the relation of th current natural areas to preserve according to the PEUMM 2008 from Maputo Municipali-ty and how their limits have been adjusted for the implementation of the Katembe plan, reducing the areas for natural spaces and constructing in them.

In the New Katembe strategy of this thesis there is a proposal to maintain the natural spaces as proposed in the past and readjust the Katembe plan.

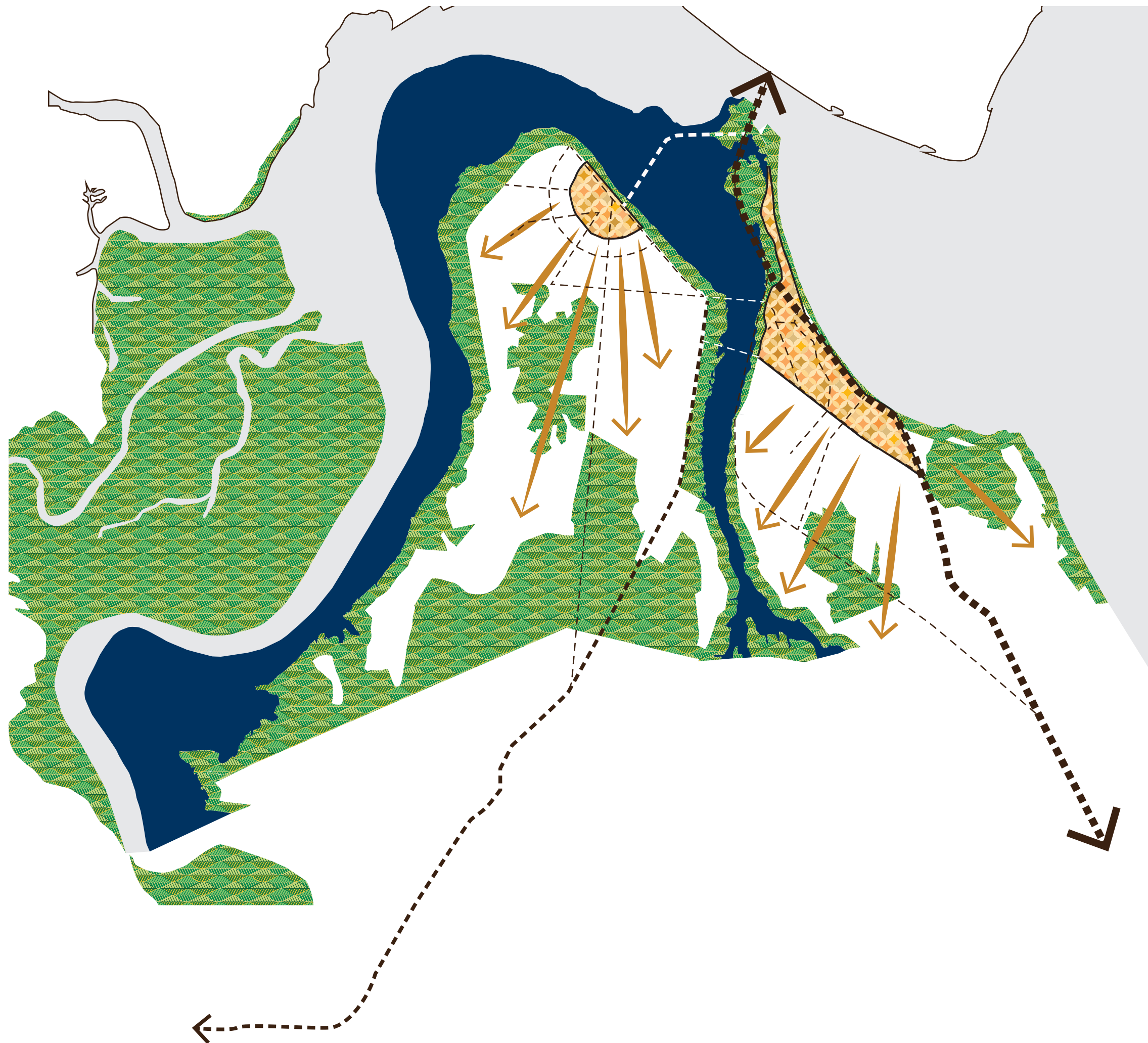
42

RELATION OF CURRENT PROPOSAL FOR NEW KATEMBE AND NATURAL AREAS

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map. PEUMM catembe information

References: Maputo Municipality, T., Betar, G., & Maputo Sul, E. (2017). A nova Katembe - Uma cidade para o futuro.



LEYEND

-  Urban development
-  Natural reservation areas
-  Guided occupation areas
-  Sustainable industry context
-  Administrative core
-  Main connections

DESCRIPTION

The current situation of Katembe shows two different densified areas located in strong relation to the future bridge and the coast-lines.

There are extension marks by low density developments that do not present proper conditions and which direction goes toward the South of the area.

At the same time, there are intentions of unifying both sides of the flooding area that divides Katembe from North to South by creating connections in relation to the main roads and urban guidelines. Among the connections, the presence of the road that connects Maputo to Ponta d'Ouro and continues to South Africa is highlighted and there is a strong relation to the development.

Finally, this map aims to highlight the presence of natural areas and the essential role they have in the current identity of the area of Katembe.

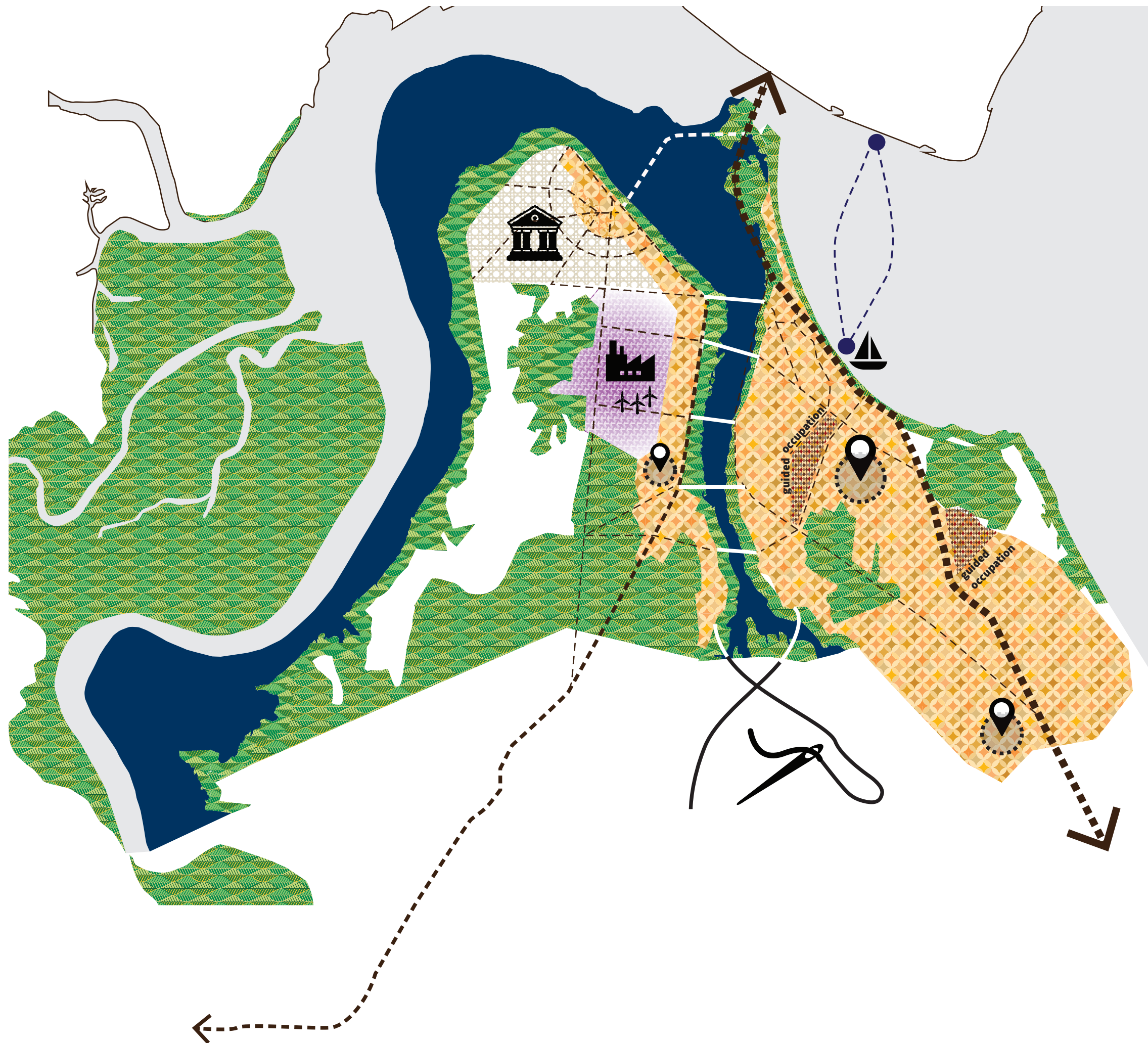
43

CURRENT SITUATION OF KATEMBE AREA







Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map. PEUMM catembe information

References: Maputo Municipality, T., Betar, G., & Maputo Sul, E. (2017). A nova Katembe - Uma cidade para o futuro. Google maps and Google earth



LEYEND

-  Urban development
-  Natural reservation areas
-  Guided occupation areas
-  Sustainable industry context
-  Administrative core
-  Main connections

DESCRIPTION

The proposed planning approach identifies two different extensions, the new administrative core closer to the bridge and the living environment. Within both extension there are different nodes that aim to be an inclusive hub not only for the inhabitants of Katembe that will work in the administrative area, but also for those will low income.

Within the proposal, there are different areas identified for the location of guided occupation strategies that will open the living environment of Katembe to the current inhabitants of the informal cities of Maputo and Matola. The industrial area proposes a new annex to the administrative zone by sustainable industrial strategies that can be accessed by sea or road routes.

The main connections are related to the accessibility within Katembe extension and the relation between the two sides of the water body. As well as the connection with Maputo and South Africa. The connection with Maputo can be also understood by maritime routes.

As can be perceived in the illustration, the natural areas are preserved and their important role in Katembe do not change. There is a proposition of preserve them by the creation of sustainable programs connected to them.

It is essential to highlight that the main aim of this proposal is to release pressure from Maputo and describe Katembe as a new center of activity and living with its own facilities.

44

RELATION OF CURRENT PROPOSAL FOR NEW KATEMBE AND NATURAL AREAS

Author: Concepción del Rocío Aranda Iglesias

Sources: GIS data from Open Street map. PEUMM catembe information

References: Maputo Municipality, T., Betar, G., & Maputo Sul, E. (2017). A nova Katembe - Uma cidade para o futuro. Google maps and Google earth.