INCLUSIVE INFRASTRUCTURE

large-scale projects and the consequences for urban development and social justice in the city of Fortaleza

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Colophon

Title: Inclusive Infrastructure: large-scale projects and the consequences for urban development and social justice in Fortaleza

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To my parents Germano e Veronica, for their love and support.

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The growth and development of cities, especially in developing countries, over the past decades has largely occurred along with the segregation of some social groups. This pattern of urbanization have been resulting in the fragmentation of space and it affects citizens' quality of life. This negative impact on social cohesion contributes to the growth of informal settlements and disconnected peripheries, as well as dysfunctional public spaces and increasing insecurity.

Brazil has been experiencing a great urban growth in the last decades, and a large amount of infrastructure has been constructed throughout the territory. Within this context of densification, Fortaleza has been site of continuous spatial transformation.

In order to understand the context where such projects are developed it is important to consider the urban development process as whole by also investigating the social and political aspects involved. There is a common understanding among the inhabitants that the spatial organization of the city has been serving the interests of privilege groups and that the public managers, in all levels of hierarchy, have been planning the city according to their terms of office and immediate private benefits.

It is the objective of this thesis to understand the decision making process of large-scale infrastructure projects on the urban development of the city of Fortaleza. In order to investigate whether the placement of infrastructure might be increasing social-spatial inequalities, and the relations with to the way decisions are made and how the projects are implemented. The way decisions are joined up might influence the access to the opportunities offered by the city as well as the performance of spatial planning in Fortaleza.

In order to address this topic a general view of the urban development and planning in the city of Fortaleza will be presented, followed by the investigation of the project of the 1st Ring Road and the following transformation of the area with the on-going implementation of a light rail.

The analysis will be developed through the lens of social justice and its applications to spatial design and spatial planning. The research is done through the analysis of the case in different scales, from the city level to a local scale. This work aims to discuss the role of planning and urban design in the construction of a more equitable, diverse and democratic city, in other words, a just city.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>5</td>
</tr>
<tr>
<td>FOREWORD</td>
<td>7</td>
</tr>
<tr>
<td>1 INTRODUCTION</td>
<td>11</td>
</tr>
<tr>
<td>1.1 Problem Field</td>
<td>13</td>
</tr>
<tr>
<td>1.3 Research Questions</td>
<td>17</td>
</tr>
<tr>
<td>1.4 Research Structure</td>
<td>19</td>
</tr>
<tr>
<td>2 SOCIAL JUSTICE AND THE CITY</td>
<td>21</td>
</tr>
<tr>
<td>2.1 Justice and the Right to the City</td>
<td>22</td>
</tr>
<tr>
<td>2.2 Spatial Planning for a Just City</td>
<td>24</td>
</tr>
<tr>
<td>2.3 The Role of Infrastructure for a Just City</td>
<td>28</td>
</tr>
<tr>
<td>3 UNEQUAL FORTALEZA</td>
<td>31</td>
</tr>
<tr>
<td>3.1 The City in Context</td>
<td>33</td>
</tr>
<tr>
<td>3.2 Urban Development of Fortaleza</td>
<td>34</td>
</tr>
<tr>
<td>3.3 Planning Tools and Culture</td>
<td>42</td>
</tr>
<tr>
<td>3.4 Governance Structure</td>
<td>43</td>
</tr>
<tr>
<td>3.5 Urban Planning in Fortaleza</td>
<td>47</td>
</tr>
<tr>
<td>4. PLANNING POLICIES AND SOCIAL JUSTICE</td>
<td>55</td>
</tr>
<tr>
<td>4.1 Democracy and the Social Function of the Property</td>
<td>56</td>
</tr>
<tr>
<td>4.2 Equity and Diversity</td>
<td>60</td>
</tr>
<tr>
<td>4.3 from Theory to Spatial analysis</td>
<td>63</td>
</tr>
<tr>
<td>5 THE CASE OF THE 1ST RING ROAD</td>
<td>65</td>
</tr>
<tr>
<td>5.1 A Highway Through the City</td>
<td>67</td>
</tr>
<tr>
<td>5.2 The Light Rail Project</td>
<td>73</td>
</tr>
<tr>
<td>5.3 The Decision Process</td>
<td>79</td>
</tr>
</tbody>
</table>
Map 1.1 Fortaleza in South America context.
Source: Author
Social-spatial conflicts have always been an important factor of the urban development processes, and it will continue being. The understanding of some of those conflicts can add knowledge to the general discussions and it might allows to build a dialogue between the world theories and specific context applications.

Thus, as it has been happening in Brazil for the last half year, other countries all over the world are also experiencing a wave of protests and popular demonstrations claiming urban life qualities and the whole of the society in the decision-making processes.

The starting point of this research is to understand the current conflicts related to infrastructure in the city of Fortaleza, building a discussion around them to search for possible alternatives and define new lines of further investigation.

1 INTRODUCTION
Fig 1.3  Social groups dynamics

high income: per capita higher than 914 reais · brazilian currency · per month (approx. 303 euro)
medium income: per capita from 261 to 914 reais per month (approx. 86.52 - 302 euro)
low income: per capita up to 260 reais per month (approx. 86 euro)

Source: IPECE
1.1 PROBLEM FIELD

With the advent and implementation of neoliberalism in the early 1970s, economics and politics were transformed to meet a new logic guided mainly by market demands and the privatization of public services, many times at the expense of the Welfare State and the city social actors.

This influence gave way to a new phase of urbanism and consequently to a new way of thinking, designing and managing cities. The large-scale urban infrastructure projects, discussed in this work, are the outcome of this context.

Thus, the so-called neo-urbanism presents a different redevelopment and restructuring of the city so closely related to strategic planning measures at the expense of urban policies and other regulations. This practice has in its model projects that are used as tools to serve the interest of the market, joint with the commitment of governments to promote their cities on the world stage and make them competitive. (Ascher, 2004).

These projects have a central role in the reconstruction of the dynamics of the urban form where they are implemented. Characteristics such as public-private partnerships, the process of gentrification, the relation with mega events and the timely character of many of these developments are some of the factors that transform them into an important regulatory tool and actor of socio-spatial impacts in the city.

Providing adequate public services is an important tool to fight poverty and promote social inclusion. However, despite the economic growth and substantial investments for the World Cup, the public investments, as in many other cities in Brazil, are not providing the adequate infrastructural projects, especially when it comes to accessibility. The issue of mobility and accessibility has become a very urgent topic in the current situation in Brazil. The country big cities have been suffering from overload public transportation system, increasing amount of vehicles in the streets and consequent increased traffic congestion. In summary, those issues are reinforcing existing and raising new social-spatial problems on the urban configuration.

Transportation investments in Brazilian cities frequently favour real estate gains over providing a quality service. New roads are created to open more investments areas for the high standard real state residential market instead of serving the transport needs of the majority of the population. Even though most of the population of Fortaleza relies mostly in the public transport (see diagram on the left), the public sector still concentrate the majority of its mobility investments on the construction and enlargement of roads and viaducts, aiming to provide more space for automobiles. The streets of Fortaleza are designed for car use, their profile does not stimulate walkability or allow the safe use of bicycles, and neither include...
lanes exclusive for public transport. As the metro system is still being introduced, buses and vans are the main public transport and have to share the road with the increasing number of cars and motorbikes. (Fortaleza, 1999)

This context, of a persisting car oriented development, even though the largest part of the population remains in poverty, arises important social conflicts. As the city cannot cope with the increasing number of vehicles, the need of a more collective approach is fundamental.

This work starts from the debate around the many investments in large-scale infrastructure projects, and the idea that those projects are a reflection of a strategic but yet disconnected actions. These actions might be bringing benefits mainly to particular segments of the population and are not following the planning policies guidelines.

Considering the idea that spatial planning is one of the main factors responsible for the urban development, therefore also accountable for the infrastructure projects processes and implications on the urban development. And by spatial planning, I refer to the collective, technical and political process able to shape the urban environment. This thesis is will be developed around the spatial planning domain.

1.1.1 Problem Statement

Fortaleza, as many metropolises in developing countries, suffers with severe urban mobility conditions, such as high traffic congestion, poor public transportation and inaccessibility. High investments in large-scale infrastructures projects have been made over the last decade, however the process and the performance of such projects can be put into question.

Despite being proposed to improve mobility in the city, those projects might be leading to a regressive urban development, contributing to increase social-spatial inequalities and compromising the right to the city.
Fig. 1.4 Informal settlement along the train tracks - community Trilha do Senhor
Source: comunidadesdotrilho.wordpress.com
**Fig. 1.5** View of Campo do América informal settlement  
Source: photo by Abel Taiti
This work focuses on the effects of large infrastructure projects on the urban development and the access to the city. This is still a broad topic, opening space for many directions of study.

Therefore, the work will be developed to pursue an answer to the following main research question:

**How can the production of large-scale infrastructure projects have an effect on social justice in the city of Fortaleza?**

In order to help achieving the answer for the main research question, several sub research questions were drawn to guide the methods of inquiry.

1. Which principles from social justice could guide urban development?
2. What is the influence of planning culture and governance structure in the urban development of Fortaleza?
3. Which planning policies and documents address the issues of social justice in the context of Fortaleza?
4. How is the decision-making process of a large-scale infrastructure project in Fortaleza?
5. What are the spatial consequences of the implementation of this infrastructure project?
6. How could a large-scale infrastructure project design be introduced more sensitively?
7. How can planning contribute to a more socially just outcome?
1. Introduction

2. Social justice and the city
   Which principles from social justice could guide urban development?

3. Unequal Fortaleza
   What is the influence of planning culture and governance structure in the urban development of Fortaleza?

4. Planning policies and social justice
   Which planning policies and documents address the issues of social justice in the context of Fortaleza?

5. The case of the 1st ring road
   How is the decision-making process of a large-scale infrastructure project in Fortaleza?

6. Spatial analysis
   What are the spatial consequences of the implementation of this infrastructure project?

7. An alternative Approach
   How could a large-scale infrastructure project design be introduced more sensitively?

8. Process Design
   How can planning contribute to a more socially just outcome?

9. Conclusion

Fig. 1.6 Thesis structure diagram
Source: Author
1.4 RESEARCH STRUCTURE

The research will be developed in the following steps:

• Literature Review and elaboration of the conceptual framework around the topic of social and spatial justice;
• Revision of the planning documents according to the conceptual framework defined;
• Analysis of the social-spatial consequences of the project of the 1st Ring Road and the discussion around the on-going Light Rail project;
• Research by design with the proposal of an alternative approach to the Light Rail project based on the theoretical principles;
• Reflection on the findings and recommendations for the decision processes.

Those steps will be divided in the chapters, and each chapter tries to answer to one of the sub-research questions, according to the diagram on the left.

1.4.1 Relevance and Key words

Social-spatial conflicts have always been an important factor of the urban development processes, and it will remain being. The understanding of some of those conflicts can add knowledge to the general discussions and allows a dialogue between the world theories and specific context applications.

Thus, as it has been happening in Brazil for the last half year, other countries all over the world are also experiencing a wave of protests and popular demonstrations claiming urban life qualities and the hole of the society in the decision-making.

Social justice; spatial justice; large-scale infrastructure; Fortaleza; Brazil; developing countries.
Fig. 2.1 View of the informal settlements along the train tracks, Parangaba district.
Source: panoramio.com
2 SOCIAL JUSTICE AND THE CITY

As the social forms the spatial, so does the spatial form the social. To break the oppressing structures of capitalist urban spaces, coalitions must be formed to create a new space with just conditions for everyone. Seeking spatial justice manifests itself in a continuous spatial re-appropriation effort. (Soja, 2010)

This section introduces the concepts of social justice and ‘the right to the city’ and explains how they will be used in the analysis of large-scale infrastructure projects in Fortaleza.
2.1 JUSTICE AND THE RIGHT TO THE CITY

There is an increasing debate around the concept of ‘social justice’ and its relationship with the city and ‘space’ in general. In developing countries and cities facing poverty and social inequalities this discussion it is even more relevant. The access to both urban development processes as well as the share of the outcome benefits tend to be unbalanced in cities with high levels of social disparities. Thus, has justice been playing a part in urban development?

The main idea of justice as fairness is presented in the work of John Rawls (1971), which consists the base to understand justice and its relation to equality. Social justice as argued in Rawls’ work, suggests a society where fairness and mutual advantage are settled. Meaning that every citizen is responsible for one another and equal chances to succeed are ensured to all. However, when it comes to societies where chances are not distributed equally, a redistribution of opportunities should be done.

Rawls argues for a balance between individual liberty and social-economic equalities. He points out the two principles of justice: liberty and difference, by which he means that everyone should be under conditions of fair equality of opportunities and any inequality should be to the benefit of the least-advantaged members of society. Despite what one finds just or unjust, equality of primary goods constitutes the basis of justice. (Rawls, 2001)

According to Rawls the principles of social justice ‘provide a way of assigning rights and duties in the basic institutions of society and they define the appropriate distribution of the benefits and burdens of social cooperation.’ (Rawls, 1971: 4)

Since the idea of ‘the right to the city’ brought by French philosopher Henri Lefebvre at the end of the 1960s much has been discussed around the topic of justice yet its spatial meaning is not very explicit.

Peter Marcuse (2009: 189) argues about the meaning of the right to the city, whose right is it, what right and to what city is it for. Marcuse states that Henri Lefebvre was more provocative than careful in its usage and that the best definition he gave in his work of 1967 is:

...the right to the city is like a cry and a demand. This right slowly meanders through the surprising detours of nostalgia and tourism, the return to the heart of the traditional city, and the call of existent or recently developed centralities. (Lefebvre, 1967: 158)

Thinking about the city as the physical space where social interactions and conflicts might take place introduces the spatial perspective of justice. The interaction between space and society links together the understanding of social justice and its spatial configuration.

Soja (2009: 1) discuss the revival of Lefebvre’s idea of the right of the city through the spatial turn given to the spatial justice concept and the spatialization of our basic ideas of democracy and human
Thinking spatially about justice not only enriches our theoretical understanding, it can uncover significant new insights that extend our practical knowledge into more effective actions to achieve greater justice and democracy. Obversely, by not making the spatial explicit and assertive, these opportunities will not be so evident.

According to Soja the critical spatial thinking considers three main principles: that we are spatial, social and temporal beings; that space is socially produced and can be socially changed; and that there is a social-spatial dialectic, which means that the spatial shapes the social as much as the social shapes the space. The emphasis on urban spatial causality explores the effects of urban agglomerations not only on social behavior but also on important processes as described by Soja such as ‘technological innovation, artistic creativity, economic development, social change as well as environmental degradation, social polarization, widening income gaps, international politics, and, more specifically, the production of justice and injustice’. (Soja, 2009: 2)

Therefore the concepts of justice or injustice are embedded in space and it is extremely important to recognize spatial justice as a way of looking at justice from a critical spatial perspective. That does not mean it can replace social, economic, or other notions of justice. Spatial justice can be evaluated both through outcome and process. “It is relatively easy to discover examples of spatial injustice descriptively, but it is much more difficult to identify and understand the underlying processes producing unjust geographies.” (Soja, 2009: 3)

It is very difficult to achieve a complete even development in terms of socio-spatial equality. Nevertheless acting towards fairness to increase justice or decrease injustice is an important aim in the contemporary society.
Public decision-making in contemporary cities is full of conflict, and principles of justice are rarely the explicit basis for the resolution of disputes. Despite, the affects in several stakeholders, the processes tend to be dominated by privileged groups in the expense of vulnerable groups. As Fainstein (2009a) points out, it is important to discuss justice and matters of equity, democracy and difference, as they can be extended to evaluate urban policy. Therefore urban interventions should promote places through democratic actions and more likely to respect equal rights and groups differences.

Planning is an important tool to address social-spatial conflicts in the city. It can provide people to engage and be included in the process of urban development, thus participation is a key element for the construction of a just city.

As Fainstein (2009a: 29-30) indicates, ‘the right to the city, however, refers to more than mere inclusion — it encompasses access to an appealing and sustaining city and the development of an urban environment and also to participation in shaping that environment’.

To the development actors, governmental and non-governmental organizations, the idea of "right to the city" seems to suggest a scenario where “human and affordable housing” and "participation" are joined up. Nevertheless their image of housing conditions is still basic and quite broad (good housing with good infrastructure at the neighborhood level and the access to environmentally friendly means of transport) and the participation often refers to mere consultation. (Souza, 2010: 316)

The knowledge of the concepts of justice and its spatial implications has increasingly spread, but the operationalization of those ideas is still very difficult to be achieved. Tackling those issues mean dealing with different spheres of power and interests as well as cultural heritages hard to be understood. Harvey and Potter (2009: 42) reflected on this matter:

"Urban rights and justice are therefore mediated by the spatial organization of political powers. Patterns of urban administration, policing, and regulation are all embedded in a system of governance that allows for the playing out of multiple interests in the murky corridors of urban politics and through the labyrinthine channels of urban bureaucracy and administration. Certain rights are coded within these systems but others are simply denied, or, more likely, rendered so opaque by bureaucratic fudging as to be meaningless."

Defining measures and ways of evaluating spatial justice conditions are essential to bring the discussion further and to develop tools that might guide spatial planning to pursue that goal.

Susan Fainstein, in her work The Just City (2010) discuss the place of justice in spatial planning and she offers a set of ‘expectations' to form the basis for what she called a just
urban planning. Her work is based on an investigation and critique of the present urban institutions and policies and concludes discussing institutional strategies and policies that result in more just outcomes and achieve greater social justice. It is not about the overall costs and benefits ratio of a given project but the costs and benefits to those least well-off or those directly and adversely affected.

Spatial Planning might be able to project forward the right to the city and a more equitable distribution of costs and benefits as it enables collective actions through participation. Not only by opening the channels of discussion, as it mostly ends in just consultation, but providing ways for community empowerment and engagement and their active position in deliberative processes.

In countries with such high disparities such as Brazil, especially in the cities of the northeast, protecting the rights of vulnerable groups is fundamental. Therefore, securing the social function of the city would ensure a fair development of the city.

A city with a just planning model would monitor the distribution of cost and benefits and promote the betterment of communities, ensuring that urban development investments give a share of the surplus back into the community.

The general idea of social justice and the right to the city are organized into four main criteria, divides in planning processes and spatial effects.
2.2.1 Principles for a just city - Based on Fainstein and Mathivet

New housing developments should provide units for households with incomes below the median aiming to provide a decent home and suitable living environment for everyone.

Household or business should not be involuntarily relocated unless in exceptional circumstances.

Relocation when needed requires adequate compensation.

Reconstruction of neighborhoods should provide available space in the vicinity for displaced households who wish to remain in the same location.

Economic development programs should give priority to the interests of employees and small businesses.

All new commercial development should provide space for public use and should facilitate the livelihood of independent and cooperatively owned businesses.

Mega projects should be required to provide direct benefits to low-income people in the form of employment provisions, public amenities, and a living wage.

If public subsidy is involved, mega projects should include public participation in the profits.

Fares for intracity transit should be kept very low as low-income people are disproportionately reliant on public transit.

Local government has the power to affect income distribution through collecting tolls and taxes on automobiles and designating the proceeds for transit support.

Planners should take an active role in deliberative settings in pressing for egalitarian solutions and blocking ones that disproportionately benefit the already well-off.

Groups that are not able to participate directly in decision-making processes should be represented by advocates.

Plans should be developed in consultation with the target population if the area is already developed. The existing population, however, should not be the sole arbiter of the future of an area.

Citywide considerations must also apply.

In planning for as yet uninhabited or sparsely occupied areas, there should be broad consultation that includes representatives of groups currently living outside the affected areas.
The social function of the city and of urban property, with the collective good prevailing over individual property rights.

Special protection for groups and people facing vulnerable situations.

A social commitment from the private sector.

A stimulus for economic solidarity and progressive tax policies.

Households should not be required to move for the purpose of obtaining diversity, but neither should new communities be built that further segregation.

Zoning should not be used for discriminatory ends but rather should foster inclusion.

Boundaries between districts should be porous.

Ample public space should be widely accessible and varied;

To the extent practical and desired by affected populations, land uses should be mixed.

Public authorities should assist groups who have historically suffered from discrimination in achieving access to opportunity in housing, education, and employment.

**DIVERSITY**

The social function of the city and of urban property, with the collective good prevailing over individual property rights.

Special protection for groups and people facing vulnerable situations.

A social commitment from the private sector.

A stimulus for economic solidarity and progressive tax policies.

Table 2.1 Principles for a just city

Infrastructure networks, within their complexity, work to bring people, buildings and places into dynamic relationships and exchanges, interactions that might not have been possible without those networks. They provide the links between systems and practices of production and of consumption, bidding spaces together across cities, regions, and nations while helping to define material and social dynamics within urban spaces.

As Graham and Marvin (2001) point out the construction of spaces of mobility and flow for some might always involves the construction of barriers for others. ‘One person’s infrastructure is another’s difficulty’ (Star, 1999: 380 quoted in Grahan and Marvin(2001)

Infrastructures networks and their processes, both social and technical, are involved in structuring and defining cultural experiences that are proper to all urban cultures of modernity and mobility. Therefore it is important to recognise how they might be inserted in a context of biased struggles for social, economic and political power and their connecting benefits.

They (Infrastructure networks) are invariably invoked in images, representations and ideologies of urban ‘progress’ and the modern city by all sorts of actors – developers, planners, state officials, politicians, regulators, operators, engineers, real estate developers and appliance manufacturers, as well as artists, journalists, social scientists, futurists and philosophers. (Graham and Marvin, 2001: 12)

It is largely discussed today how the public sphere is losing space to the increasing privatization. On the last decades with the progressive reduction of the public power towards a market-led development, the cities have been facing a privatization also of public goods. Places of gathering and recreation in the city of Fortaleza are now mainly within private domains. There is an important debate along this topic, however the focus here will be around infrastructures and their role as public spaces.

Infrastructure may be seen as the ultimate public space: it is generally paid for by public authorities, it is accessible to almost everyone, and it marks a common itinerary or a collective place. Infrastructure, by its very nature, expends the public realm beyond the boundaries of a single space. (Shannon and Smets, 2010: 184)

Road infrastructure is a fundamental component of the public realm. Especially in car-oriented cultures, as the case of Fortaleza, driving acts as a replacement for walking or biking and it generates experiences of gathering, encounter, and discovery as well. It is common in some Brazilian cities meetings and gatherings at gas stations for example.

In many cases ‘public space’ is now under the direct or indirect control of corporate, real estate or retailer groups which carefully work with private and public police and
security forces to manage and design out any groups or behaviour seen as threatening to the tightly ‘normalised use’. (Graham and Marvin, 2001: 232)

The same have been taking place in Fortaleza, as the increasing number of semi-public spaces, such as shopping malls and recreational parks, focused predominantly to consumption and paid recreation by those who can afford it and who are considered to unrestricted access. These areas are taking the place of public streets and spaces, as in many other cities in North America, Australia, the United Kingdom and continental Europe, and increasingly of Asian, Latin American and African cities, as pointed out by Graham and Marvin (2001).

Table 2.2 The Potential of Infrastructure
Source: Author’s based on the literature
Fig. 3.1 Fortaleza in the 90s
Source: www.fortalezaemfotos.com.br
Fortaleza and most of the large cities in Brazil are experiencing a great population and economic growth. The effects of growth have increased the investments in urban development and the expansion of the cities and its structures, however that has been carried on a urban development approach that is often translated into spatial segregation, social inequality, environmental degradation, and especially social exclusion.

The city of Fortaleza is one of the most unequal cities in the world and the spatial organization of the city has tended to serve the interests of privileged groups, concentrating the power on the government and its continuous top-down approach, leaving the society most of the times out of the decision-making processes.
3.1 THE CITY IN CONTEXT

Fortaleza, according to the last census of 2010, is Brazil’s fifth largest city in population with 2,452,185 inhabitants. It has the highest population density in the country with 8,001 inhabitants per km². The capital of Ceará has the ninth GDP of the country and the highest in the northeast region, arising significantly from tourism and its diversified commerce. The manufacturing industry produces footwear, textiles, leather-derived items, and processed food and beverages.

Fortaleza is the centre of an important metropolitan region comprising 15 municipalities and a total population over 3.6 million inhabitants. The area of influence of Greater Fortaleza is the largest in the North-Northeast regions in terms of population, serving as a reference for more than 20 million people, behind only the metropolitan areas of São Paulo and Rio de Janeiro. (Brasil, 2011)

The metropolitan region since its foundation in 1973 with only 5 municipalities remains poorly integrated. The city of Fortaleza houses 70% of the population and produces most of the GDP of the region. The peripheral cities are relatively isolated from the main urban agglomeration and the capital still has a concentration of industries and commercial establishments. With the construction of the Port of Pecem in 2002, however, this scenario should be in transformation as big industries and the larger part of the cargo transport are shifting to this new location on the west coast of the metropolitan region.

Fortaleza is acknowledged as one of the most unequal cities of Brazil, as the levels of social inequalities are very high. The GINI Index is used to measure the levels of distribution of income. Thus a GINI index of 0 represents total equality while an index of 1 means completely income inequality. The numbers show that Fortaleza dropped from 0.64 in 2000 to 0.61 in 2010 in the GINI index, yet significantly higher than the 0.52 of the country average. The percentage of poor fell from 27.54 per cent to 12.14 per cent in the same period and the percentage of population under the poverty line has declined in the whole country. However, it is misleading to assume that social and income inequalities have dropped, but rather poverty levels have decreased and disparities are still great. (Brasil, 2011)

The urbanization level in Brazil is still increasing. Since 1970 the population in the metropolitan region of Fortaleza has more than tripled from one million inhabitants to over 3.5 million. There is a process of migration and concentration in the urban areas going on, especially in regional centres such as Fortaleza. Brazilian Northeast experienced an urbanization process later than the more developed cities of São Paulo and Rio de Janeiro that received migration from the entire country in the 1960s and 1970s, significantly from the Northeast region itself. That was a reflection of national development strategies that allowed the rise of big disparities between the more industrialized south-eastern Brazil and the undeveloped Northeast. (Sampaio, 2003)
3.2 URBAN DEVELOPMENT OF FORTALEZA

The development of Fortaleza has an important relation with the natural conditions and its role on shaping the city. In the eighteenth century the occupation and prosperity of the city was mainly related to the proximity to natural transportation routes. The landscape of Fortaleza was appropriated due to its predominance of flat lands, abundant sources of water and a natural harbour good for shipment of the goods produced in the hinterland. (Sampaio, 2003)

According to Muniz (2006) the first attempt of settlements in Fortaleza in 1603 failed due to the resistance of the local indigenous peoples and high wind speeds of the area. Thus, the process of occupation in Fortaleza emerged during the Dutch expansion and their search for a defensive point in 1649. They built a fort on the banks of the river Pajeú, the fort consisted in a mix of military base and commercial point. The area around the fort became a place for social attraction and soon an agglomeration of huts were formed.

In 1654 the Dutch were expelled by the Portuguese and they changed the fort from Shoonenborsch to Fortaleza de Nossa Senhora da Assunção. Thereafter the small settlement with economy based on cotton cultivation and livestock experience rapidly growth and became a village in 1726. This is the date that is celebrated the foundation of Fortaleza and when it became the seat of power of the Captaincy of Ceará.

The village of Fortaleza, however, was of little importance compared to other towns as Aquiraz, Aracati, Ico and Sobral. The capital of the state was still Aquiraz that had the influence of the owners of allotments for the livestock. In 1799 the captaincy of Ceará became independent of Pernambuco and start to commercialize directly to Europe, which enabled the development of Fortaleza. However, it was still commercially dependent of Aracati, the compulsory point of commerce with Pernambuco.

It was in 1923 that the village acquired legally the status of city. From that point Fortaleza experience a great economic development with the export of cotton to Europe. By the end of the XIX century new facilities would be built such as the first harbor infrastructures, public buildings, hospitals and textile industries. The occupation of the plains evolved through the 19th century and the city developed as an important center to the region as Sampaio describes (2003: 29):

*The construction of the Port of Mucuripe in 1950, the installation of a railroad line and the gradual consolidation of the regional road network converging on the city both explain and are explained by Fortaleza’s economic supremacy in relation to the region. Population migration from the countryside toward the city followed. In the last decade, after the city surpassed 2 million inhabitants, state polices have attempted to dislocate industry and regional transportation facilities outside of the central city, with
limited success.

The position Fortaleza developed as a metropolitan region attracted substantial investments through the decades and increased the developmental gap in relation to the rest of the State. Attracting a great migration from the hinterland in a rather fast pace.
Map 3.1 Urban growth before 1875
Source: Based on Directive Plan 2009

Map 3.2 Urban growth 1875 - 1959
Source: Based on Directive Plan 2009

Map 3.3 Urban growth 1959 - 1978
Source: Based on Directive Plan 2009

Fig. 3.3 Plan of the Village of Fortaleza 1730
Source: Acervo Arquivo Nirez

Fig. 3.4 Ceara tramway 1880
Source: Acervo Arquivo Nirez

Fig. 3.5 Beach Promenade (Beira-Mar) 1960s
Source: Acervo Arquivo Nirez
3.2.1 CITY EXPANSION

The region where Fortaleza is located has been developed in a very unbalanced way through time. In the early years the region was kept only as matter of territory control, it was not a first target for development and occupation as the south of the country. However in the second half of the twenty-century the city had a great population growth and a large territorial expansion as well. This growth was a result of the commercial development of the city and the consequent migration.
road system + income

This map shows the relation between the provision of road infrastructure and the income distribution in the city. As we can see, the central areas are well served and connected by roads and they are also the areas where the groups with higher income are living.

Most of the highways are outside the central core of the city, avoiding the orthogonal grid that forms the centre, a grid that provides great road integration but also contributes to high traffic congestion and bottlenecks.

Map 3.6 Road system and income per district
Source: Based on municipality cartography and IBGE 2010 census
The city is served by general economic services and basic facilities on its central areas and surrounding districts. The areas in the periphery and along the limit of the municipality, however, are not well served by services and have a very low jobs supply. Which concentrated most of the opportunities on the central areas, therefore reinforce the necessity of long distances commuting.

Map 3.7 Jobs supply and services locations
Source: Based on municipality cartography and Parente (2008)
The expansion of the city started from the central core on the north towards the west side, thus the areas of higher density are mostly within this axis. The public transport lines, basically buses and informal vans, are following the demand of the high populated areas, being in higher volume along this axis as well.

Comparing to the previous map with the income distribution, we can notice that the areas better served by bus and higher in density are also the districts where the groups of lower-income are living.

**Map 3.8** Density and public transport
Source: Based on municipality cartography, ETUFOR and IBGE 2010 census
poverty + informal settlements

From this map we can conclude that the central core of the city is defined by the higher income groups. The populations with higher levels of poverty are completely segregated from the centre, as well as the informal settlements.

This maps shows the result of a process of gentrification that have been happening through the last decades, whilst the city was been consolidate.

Map 3.9 Poverty and informal settlements
Source: Based on municipality cartography and Parente (2008)
3.3 PLANNING TOOLS AND CULTURE

In order to fully understand the process of spatial development in Fortaleza and the context in which planning is embedded, it is necessary to discuss the cultural legacy and the doctrine behind the land management in the region.

The historical process of Brazil from a colony until today's Federal Republic can tell a lot about the way public power has been practiced and consequently the way decisions have been made. Thus it might still be reflecting in the decision-making process of urban development today. It is difficult to decipher how cultural patterns shape political behaviour and therefore the planning doctrine. However, highlighting some of the important moments might give some indications.

During the first period as a republic, Brazil's political machine was under a system called 'coronelismo'. It is described as "the political domination of local and regional strongmen and their armed followers in rural areas" of Brazil, especially in the Northeast countryside (Singlemann, 1975). Also known as the "rule of colonels", it refers to the classic boss system under which the control of patronage was centralized in the hands of a locally dominant oligarch known as a colonel. Colonels offered various services and commodities in exchange for political and social authority from members in their community. It has a dominant role in local and state politics and to gain authority, the colonel established a patron-client relationship, called clientelism. This is the theory in which this type of relationship is classed.

The political phenomenon of 'coronelismo' was largely associated with the wealthy coffee oligarchs from the states of and Minas Gerais during the Old Republic, however as Resende-Santos (2001) points out, 'No state can be said to be more cursed by the heavy hand of traditional politics, clientelism, absolute poverty, and social stratification than the small and impoverished Northeastern state of Ceará.'

The origin of the term goes back to when Brazil was still a colony and people sought military commission. These colonels acquired wealth and power and the term stuck with the introduction of the National Guard.
3.4 GOVERNANCE STRUCTURE

The Federative Republic of Brazil consists of four federated entities not subordinate to one another. The municipalities are the local bodies most closely in touch with the population. The States consist of several municipalities. The third entity is the Federal District that corresponds to the administrative seat of the country and final is denominated Union, which represents the total sum of the States and the Federal District.

Each one of those entities is responsible for elaborating its own laws, executing public policies, and fixing and collecting taxes, as long as it is in accordance with the distribution of competences set forth in the Federal Constitution. For certain subjects and policies, the Federal Constitution makes cooperation between these entities obligatory.

In the case of Urban Development Laws, legislative competence is simultaneous and requires cooperation between the federated entities. The municipalities are responsible in the development of urban policy according to the attributes conceded by the Federal Constitution, while the states are responsible at the level of the Metropolitan Regions.

In the current political scene in Fortaleza several different institutions and departments respond for the urban development in the city. Apart from the Department of Planning, Budget and Management (SEPLA), the Planning Institute (IPLAN), the Department of Infrastructure (SEFIN) and the Department of Urbanism and Environment (SEUMA), at least other four departments are also developing urban infrastructure projects in the territory at the same time. how does the plan relate to these organisations

The issue of such structure is not the number of bodies addressing the urban spatial matters, but the lack of integration between them. Adding to it the political interests, short term strategies, corruption culture and the fact that the spatial management is done by technocrats and bureaucrats, social participation in the decision making process gets severely compromised. Even though in principle the law guarantees it, the quality of the participation realized is unsatisfactory.
MINISTRY OF THE CITIES
   National Department of Housing  
   National Department of Environmental Sanitation  
   National Department of Transportation and Urban Mobility  
   National Department of Accessibility and Urban Programs

SECRETARY OF THE CITIES
   Coordination Office for Urban Development  
   Coordination Office for Social Housing  
   Coordination Office for Environmental Sanitation  
   Coordination Office for Special Urban Projects

Planning Institute (IPLAN)

Department of Planning and Budget Management (SEPLA)

Department of Infrastructure (SEINF)  
Department of Urbanism and Environment (SEUMA)  
Housing Development Foundation (HABITAFOR)  
Department of Tourism (SEFOR)  
Department of Maintenance and Public Services (SCSP)  
   Urban Transport Company (ETUFOR)  
   Municipal Transit Authority (AMC)

07 Regional Executive Departments (SER)

Fig. 3.8 Urban development governance structure  
Source: Based on interviews in the municipality and state government departments and government agencies websites
Fig. 3.9  Topographical plan of the city by Adolpho Hebster in 1875
Source: Fortaleza Municipality in Muniz (2006)
3.5 URBAN PLANNING IN FORTALEZA

The urban policy in Brazil has been developed through the elaboration of urban plans. The first plans were basically cartographic plans of the cities formations, later they become master plans of the city expansion with few indications for improvement of the urban conditions. With the cities economic and population growth the plans developed in instruments to remodel and define the cities structures, becoming more and more directive of the urban transformation.

The main instrument of the spatial planning in Brazil is the Plano Diretor, which I will call in this work Directive Plan. It had different names though the years, and each plan can have a different full name, however the latest plans all have in common the character and the use of the word “directive”.

Directive Plan is the basic instrument of a municipal planning process for the implementation of urban development policy, guiding the action of public and private actors. It must be a plan that provides a scientific analysis of the physical, social, economic, political and administrative situation of the municipality and its region. From which it offers a number of proposals for the future socioeconomic development and spatial organization of the urban space, the network infrastructure and key elements of the urban structure. These proposals are set to short, medium and long term and approved by municipal law.

Villaça (2004) emphasizes the lack of a widely accepted concept for whatever the plans are. Arguing that there is no consensus among the actors involved in their preparation and use - engineers, planners, real estate developers, landowners and so on - to what exactly is this instrument.

The directive plan should be a tool that guides all concrete interventions on the territory, regardless of whether these actions are carried out by individuals, companies, and public sector or by any other actor. It consists in a descriptive document of the territory with a set of descriptive maps and data that results in general strategies. It provides policy guidelines and mechanisms for implementation addressing the issues encountered in the analysis. These guidelines together with a set of zoning plans and road hierarch maps become law and are further developed in specific laws, as the Land Use law and the Building Code.

Based on Muniz (2006), the urban planning history of Fortaleza can be divided in four main phases: 'expansion plans', 'proposition plans', 'technocratic planning' and the last and currently 'participatory planning'.

The first phase attempted to direct the development of urban structure and city expansion in a directive way, basically defining streets layout. The first plans, Silva Paulet’s plan in 1818 and Adolfo Hebster’s plans of 1863, 1875 and 1888, are responsible for the urban structure of the city centre, especially for the implementation of the current radial-concentric fabric and
road layout, a orthogonal grid proposed to facilitate the circulation of people and goods. The grid is consolidated on the central area and the urban expansion occurs along the radial axes, reinforcing the historical centrality.

In the following century Fortaleza goes through several transformations in its physical structure due to its intensive population growth, which was not directed by urban planning. A long period without planning follows and problems arise from this rapid densification, especially among the poorest inhabiting the periphery, far from the infrastructures and public services concentrated in the city centre as explained by Ponte (1995) quoted in Muniz (2006: 133):

*The urbanization of Fortaleza, beyond the enthusiasm and reinforcement of ideals of ‘progress and civilization’ generated within the elites, brought along urban and social problems such as agglomeration, proliferation of houses and buildings, the emergence of epidemics and endemics, besides the number of workers available, homeless, insane people, poor and abandoned children.*

During the twenty century the city still experience an intense population growth. The main reason of this growth is the migration flows caused by the periodic droughts in the countryside of the state that directed people to the capital. This rapid growth and the urbanization process resulted in several changes in the city. New buildings were built for the new populations and the consequent great agglomeration of poverty brought back the concern of the public sector with the city planning. However the focus was higher on urban infrastructure, with the construction of water supply system and underground sewage, than on the planning for the city expansion. (put source)

The first decades of the twenty century were dedicated mainly to sanitation and aesthetics, missing a comprehensive city planning. Only four decades later, in 1933, the second phase starts and the first proposition plan was realised, the Redesign and Extension Plan of Fortaleza by Nestor de Figueiredo followed by the plans of Sabóia Ribeiro of 1947 and Hélio Modesto of 1963.

This period introduces the first directive plans, different from the previous phase that did not consider the city in its totality, this new phase aimed to remodel the city structure through more structural proposals.

This phase was influenced by the Athens Charter and the ideas of the Modernism in Brazil. The introduction of the automobile in 1910 and the high expectations for car ownership strongly influenced the plans. The priority was on road hierarchy plans and highways proposals instead of public transportation, resulting in some of the railways lines being deactivated for people transportation over time.

The first zoning plans are used as a tool to define the areas of the city in commercial, mix-use, residential (high, medium and low density) and industrial. The recognition of other centralities within the city and the attempt to define at least 10 per cent of green areas for each district

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1933 Athens Charter produced as a result of the IV International Congress of Modern Architecture (CIAM)
were important new considerations in this planning phase.

There was also the indication for infrastructure distribution throughout the territory and strengthening the link between east and west. However, the plans were still reinforcing the radial connection to the city centre. From this phase only the last plan of 1963 actually became a law, but none of them were in fact implemented. Despite not being implemented, those plans had great influence in the following plans and they set the base for the planning tradition of the direct plans.

Fig. 3.10 Plan of 1811
Source: Acervo Nirez

Fig. 3.11 Plan of 1730
Source: Acervo Nirez
expansion plans

propositive plans

1818 - 1888

1933 - 1963
Fig. 3.12 Fortaleza urban planning timeline

1. Fortaleza city plan by Adolpho Herbster (1818)
2. Exact plan of Fortaleza by Adolpho Herbster (1859)
3. Extension and Redesign Plan of Fortaleza, by Figueiredo (1933)
4. Extension and Redesign Plan of Fortaleza, by Sabôia Ribeiro (1947)
5. Integrated Development Plan of the Metropolitan Region of Fortaleza – PLANDIRF (1972)
   (Source: Fortaleza Municipality in Muniz 2006)
   (Source: Fortaleza Municipality in PDP 2009)

1972 - 1992

2009 -

technocratic planning

participatory planning

city statute - 2001
The third phase of the urban planning evolution in Fortaleza: ‘technocratic planning’, finished recently and it was responsible for the elaboration of plans by technicians and specialists. They have the character of being development plans as the city is already consolidated, thus there is more than only the territorial dimension involved. In this phase there is a continuity of the idea of decentralization with the focus on the road links through corridors for fast flow.

The road hierarchy maps have a fundamental importance in those plans. New roads are proposed, as well as the widening of some of the existing, the concept of fast roads (commonly called express roads) and prioritization of the vehicles is clear the driver of development. Since the historical centre had a consolidated design with narrow streets in a grid with blocks of 100x100 meters, the radial and ring roads were thought as the main axes for fast transportation and link between the centre and peripheral neighbourhoods.

The last plan of this phase and perhaps the most important due to its duration and relevance until today is the Directive Plan of Urban Development of 1992. It was the first plan after the Federal Constitution of 1988 and it influenced and also tried to anticipate some of the ideas of the City Statute, such as societal participation. Although it was meant to last for ten years, due to several political conflicts it remained valid until the approval of the current Participatory Direct Plan in 2009.

The fourth and current phase of planning: ‘participatory planning’ arrived as a requirement of the City Statute. It intends to bring closer the civil society to the process of planning and urban management. The previous plans were elaborated by technicians from the public sector or contracted specialized offices. The society starts to be seen as a fundamental actor of the process only after the City Statute.

Most of the cities directive plans are formulated as a law that regulates urban development. But, both the population and the government most of the times are not fully aware of its importance concerning relevant issues of municipal administration, such as its relation with economy, taxation, social issue, land use regulation, in summary, with all the aspects that constitute and that a municipal government should manage in the best possible way. (Muniz, 2006)

The decisions about development and investments have always been connected to the duration of a political term and that way public managers many times implement restricted measures aiming to just attain a political-electoral objective and publicizing their administration. Therefore, spatial planning in cities like Fortaleza is restricted to the elaboration of directive plans that are left ignored when it comes to their operationalization.
Fig. 3.13  Zoning map of the Participatory Directive Plan of 2009
Source: Fortaleza Municipality - PDP 2009
Fig. 4.1 Houses being demolished for the light rail implementation
Source: Author
This chapter analyses some of the planning instruments and their relation with the principles discussed in the second chapter. The aim is to understand to which extent plans and regulations address the issues of social justice on the spatial development of the city.

The urban development instruments discussed in this section are the laws below:

- *Constituição Federal of 1988 (Brazilian Federal Constitution)*;
- *Estatuto das Cidades of 2001 (City Statute)*;
- *Lei de Uso e Ocupação do Solo of 1996 (Land Use Law)*;
- *Plano Diretor Participativo of 2009 (Participatory Directive Plan)*
4.1 DEMOCRACY AND THE SOCIAL FUNCTION OF THE PROPERTY

The re-democratization of Brazil, with the end of the military dictatorship, was followed by the increase of organizations and urban social movements resulting in several achievements towards an urban policy for Brazil:

• 1987 Popular Initiative Constitutional Amendment subscribed to by six civil society bodies. Establishment of the Urban Reform National Forum comprising civil society entities.

• 1988 Promulgation of the new Federal Constitution with two chapters focused on the urban theme for the first time in Brazil’s history.


• 2003 Creation of the Ministry of Cities. The National Conference of Cities (Conferencia das Cidades) was the result of a participatory process involving 3,400 municipalities, from all states of the Federation, with over 2,500 delegates elected to debate the National Urban Development Policy. Other conferences took place in 2005 and 2007.

• 2004 Establishment of the National Council of Cities as a consultative organ of the Ministry of Cities. Creation of the National Programme for Urban Land and Property Regularisation.

• 2005 Approval of the Federal Law which provided the regulatory framework for Environmental Sanitation, overthrowing the privatisation proposal in dispute over the previous 13 years.

• 2005 Approval of the Federal Law governing the National Fund for Social Housing under which a fund and a specific Council were established involving social participation as well as making the release of federal funding dependent on the existence of housing plans, state/municipal funds and the establishment of Councils. In the same year the National Campaign for the Participatory Master Plans was launched, requiring the elaboration of Master Plans for all cities with over 20,000 inhabitants.

There was a great shift for urban development in Brazil after the Federal Constitution of 1988. The introduction in a federal law of the “social function of the property” influenced the elaboration of the City Statute and the following directive plans.

The articles 182 and 183, respectively, of the constitution (Brasil, 1988) state that:

*The urban development policy enforced by the municipal government, according to general guidelines established by law, aims to order the full development of the social functions of the city and ensure the well-being of its inhabitants.*

*One who possesses an urban area of up to two hundred and fifty square meters for*
five years, without interruption or opposition, using it to his or her family, acquire the domain of it, long as one does not own another urban or rural property.

Those articles also define that urban property expropriations shall be made with prior and fair compensation in cash.

In the difficult task to overcome the significant social inequality of Brazilian cities, the participatory process now plays an important role in the battle for investments and efforts to provide an urban planning system that takes into account the needs of low-income people living in the city. In other words, it is a way of ensuring that the less favoured members of the population, traditionally excluded from the planning process in the cities, are able to participate in the entire process of urban development of the city they live in.

The City Statute of 2001 is a national law that regulates and take further the articles of the federal constitution, establishing norms of public order and social interest, which set the use of urban property in favour of the common good. One of the main objectives of the statute is to regulate participation by society in decisions about how the land is regulated and occupied, as well as having a say in how public funds are to be used, as well as ensure citizen deliberation in decisions involving the use of public funds. (Brasil, 2001)

Exploring these possibilities, the City Statute introduced a number of instruments to ensure the democratization of city administration in an effort to encourage popular participation in decision-making processes and to prevent cities from a model desired by those with sufficient economic power capable of influencing political decisions. These instruments include: the creation of councils, the holding of public meetings and municipal urban policy-related conferences.

Even though the local council chambers member are elected democratically, decisions about the future of cities cannot be limited to them, they need to involve all those directly affected by public actions and investments. ‘It is not simply a question of ‘consulting’ popular opinion about proposals put forward by the municipality, but to guarantee the existence of genuinely effective consultative and deliberative fora [sic] during the urban planning process.’ (Carvalho and Rossbach, 2010)

As Caldeira and Holston (2005) note, the two fundamental innovative elements of the City Statute on urban management are “those requiring popular participation in the formulation and implementation of policies, and those considering that urbanization is to be obtained by cooperation between government and private organizations’.

Under the denomination of Operaçoes Urbanas Consorciadas (urban operations consortium), the idea of the public-private partnerships according to the city statute is to enable urban projects conforming to municipal urban planning guidelines on specific areas of the city under municipal public authority by means of the private capital.
Another important instrument present on city statute is the Estudo de Impacto de Vizinhança (Neighbourhood Impact Study). This study should enable the local government to evaluate the consequences of the establishment of large developments or major extensions to existing constructions. Throughout this process the community must be allowed to participate in decisions, and it is an obligatory requirement that all the documents and studies are available for consultation by any interested party. Is the responsibility of the municipality the elaboration of a specific law identifying the activities and developments that might be subject to this study, that has to be developed beforehand any license be issued. (Carvalho and Rossbach, 2010)

Considering the municipal level, the last phase of Brazilian directive plans have a strong participation character. The Urban Development Directive Plan of Fortaleza of 1992 was elaborated by a technical team formed by employees of different departments of the Municipality and contracted consultants. It anticipate some of the ideas of the City Statute as it indicates that the urban property fulfils its social function when the collective interests are prevailing in the exercise of the rights inherent to it. (Fortaleza, 1992)

It was the first plan to try to incorporate participation by society in the propositions of the urban development. Several seminars were held with the civil society, associations, professionals and students. However, the proper understanding of the plan and its significance for the urban development of the city was very low, including the public authorities, thus the participation remained negligible. (Muniz, 2006)

The 1992 plan was a great progress towards including the population into the discussions about the urban conditions and the future of the city, however it could not provide mechanisms to promote effective contributions through citizen participation.

It also introduced a guideline for adequate use of voids and underused urban land suppressing it speculative holding, it created legal instruments such as compulsory land parcelling, expropriation of private land and progressive taxation. Those instruments aimed to increase the access of the low income population to urban land, a principle of the democratisation process of the country, as introduced by the federal constitution. (Caldeira and Holston, 2005)

The Participatory Directive Plan of 2009 came after the approval of the city statute, therefore it is entirely guided by the statute guidelines. According to this municipal law, the urban policy of Fortaleza should follow four fundamental principles: social environmental function of the city, social function of the property, democratic administration of the city and equity. One of its main goals is to achieve a democratic and participatory system of planning and management of the city. (Fortaleza, 2005)

The current directive plan indicates mechanisms for popular participation such as public audiences, debates and public consultation where the citizens are informed and can manifest their options, be part of discussion of the plans and projects and other urban policy topics.
Another important mechanism defined by this plan, is the participatory budget-making, with this mechanism, the approval by the Council Chamber of the plans and annual budget is conditioned to the public consultation.

During the elaboration of this plan, several popular committees followed and monitored the planning process, and the popular participation was the key element of the elaboration of this instrument. The plan was presented and discussed in several public meetings with significant representation of the civil society, private companies and public sector. It was voted and approved in public audience and through the whole process the population could be an actor on the decision-making of priorities and main objectives.

Although it consists in a bottom-up process of such an important instrument, the final result remains subject of criticism, for two main reasons in relation to the participation and democratic process. First, the society could participate in decisions in the level of the city and not of the neighbourhood, apart from some low-income informal communities, many groups of the society are not articulated for a common benefit. Thus, instead of deciding over concrete spatial demands in the scale of the neighbourhood, the decisions made were very broad and vague, perhaps too ambitious.

The second critique is to the weak articulation between the technicians elaborating the plan and the population, once again the population is not completely instructed of its competence on the process and most citizens are not aware of their real needs. In the attempt to elaborate a real democratic instrument, the technical quality was compromised and the result is an indicative plan instead of a truly directive one.
4.2 EQUITY AND DIVERSITY

The City Statute is an important instrument to pursue social justice, as it introduces mechanisms to ensure the promotion of just and fair cities in which all inhabitants, both rich and poor, should benefit from the urbanization process.

It defines a broad set of instruments to enable the Municipality to formulate an urban policy that can give concrete translation to the right of all people to the city, such as: tenure regularisation of property used for social purposes; urban development and redistribution to the community of the benefits arising from the urbanisation process and the right to housing: free technical and legal assistance for poorer communities and social groups and the establishment of Zonas Especiais de Interesse Social (Special Zones of Social Interest).

The Special Social Interest Zones are an instrument used to regularize occupied areas where the process of occupation has occurred regardless of urban planning rules, and it can also be used for vacant areas to be designated for social housing.

This mechanism enables the possibility to use special urban parameters according to the form of occupation undertaken by the community, for example, the installation of narrow streets that are more suitable for occupied hilly or steep areas, or also for ‘consolidating’ settlements occupying environmental preservation areas, minimising the need for removing homes during the process of tenure regularisation.

Other mechanisms should be implemented that prevent the eviction of residents from already regularised settlements and their subsequent occupation by wealthier social segments attracted by rising property prices. Ways of preventing this gentrification process is the prohibition of lot ‘re-parcelling’ to avoid situations where someone can acquire various lots, transform them into a single larger lot and construct new buildings on the land; or defining a type of land use, for example only single-family units.

When applied to vacant or unused properties, the special zone enables the public authorities to reserve areas that already benefit from infrastructure and urban facilities for social housing, by doing that it is possible to avoid the eviction of the worst-off, forcing them to live in peripheral areas remote from the urban centres.

The city statute, however, notes that it is responsibility to each municipality to regulate and apply instruments to follow those strategies. Thus, the directive plan must create detailed instruments and regulations to ensure their effective application.

The directive plan of 1992 introduces to the urban development of Fortaleza the implementation of the special zones, however it focus on environmental interest and urbanization priorities zones, but it does not mention yet the zones of social interest.
Following the city statute, in terms of equal access to the city, the directive plan of 2009 highlights as one fundamental objective the promotion of social justice through eradication of poverty and social exclusion, reduction of social inequalities and social-spatial segregation.

It defines the right to the city, as the right to urban land, to adequate housing, to sanitation, to urban infrastructure, to transportation, to public services, to work and leisure, for the current and next generations.

And according to it text, it is fundamental to promote a sustainable development by the just distribution of costs and benefits that arise from the urbanization process, transferring back the surplus to the society. The law also mentions mechanisms to fight land speculation and implementation of special zones of social interest.

In fact, perhaps the main contribution of current directive plan is the definition of the special zones, as it is the first time that most of the informal occupations of the city are mapped and can have a special treatment.

Map 4.1 Map of the Special Zones of Social Interest
Source: Directive Plan of 2009
<table>
<thead>
<tr>
<th>PRINCIPLES</th>
<th>ANALYSIS</th>
<th>SCALES</th>
</tr>
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<tbody>
<tr>
<td>sensitive relocations when inevitable</td>
<td></td>
<td>CITY</td>
</tr>
<tr>
<td>access to jobs and education opportunities</td>
<td>SOCIAL PATTERN</td>
<td>STREET LENGTH 4X6KM</td>
</tr>
<tr>
<td>good and accessible public spaces</td>
<td>HOUSING DISPLACEMENTS</td>
<td>NEIGHBOURHOOD 1X1KM</td>
</tr>
<tr>
<td>mixed land use</td>
<td>ROAD STRUCTURE AND FRAGMENTATION EFFECT</td>
<td>LOCAL 200X200M</td>
</tr>
<tr>
<td>sustainable means of transport</td>
<td>OPEN AND PUBLIC SPACES</td>
<td>CASE STUDY</td>
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<td>diversity of social groups</td>
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<td>porous boundaries</td>
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<td>infrastructure as a public space</td>
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</tbody>
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| PHYSICAL MEASURES                |                                              |                                    |
| enable transparent decisions in planning |                                | PLANNING CULTURE                  |
| organise inclusive and transparent processes | 1ST RING ROAD PROJECT               | FRAGMENTED GOVERNANCE             |
| priorize interests of local dwellers and vulnerable groups | LIGHT RAIL PROJECT                | DESIGN PHILOSOPHY                |
|                                    |                                              | COSTS AND BENEFITS                |

Table 4.1 From theory to spatial analysis
Source: Based on the literature review
4.3 FROM THEORY TO SPATIAL ANALYSIS

One of the main objectives of this research is to interpret the literature reviewed and use it to guide the spatial analysis. The main principles of social justice used here are divided in two main sections, one that tries to translate the concepts to physical measures and the other section which focus on the process part of the implementation of a project into space.

The principles are collected in four main criteria for the spatial analysis - social pattern, impact in housing displacements, the road structure and the condition of open and public spaces - and the analysis is developed through different scales.

The investigation of the decision making process tries to describe the history of the 1st Ring Road based on the information gathered in the public sector and on the interviews with the residents of the area. This investigation is guided by the principles and intends to understand the levels of participation and transparency of the decision making process and implementation of the project.

The process is investigated mainly through four main topics: planning culture, governance structure, design philosophy and the project distribution of cost and benefits. These different topics will help to identify the problems and the potentials of the area regarding the process, and will provide the link to the spatial analysis further on.
Fig 5.1 View from a house on the 1st Ring Road
Source: Author
As discussed in the previous chapters, in the last decade there was a significant shift in the way spatial planning addresses social justice in Fortaleza. However, despite its good aspirations, the laws and policies remain quite blunt and hardly connected to the actual spatial implications of urban developments, especially when it comes to large-scale infrastructure projects.

The development of large infrastructures requires high investments by the public sector, and this has been historically a great opportunity for private developers and investors to benefit directly from them. New mechanisms, however, were introduced in the last directive plan to enable partnerships that stimulate the private capital participation also on the development of public infrastructures.

Brazilian cities major roads have always been placed to open real estate markets and favour high-income neighbourhoods instead of isolated low-income settlements. Neoliberal investments have been using road projects to enable market led gentrification of informal settlements located at sites potentially profitable for private investments. (Sampaio, 2003)

Thus, as an essentially public investment, projects of transport infrastructure have a large impact on the space and the distribution of costs and benefits to who is affected by them. In order to assess the impact of this type of infrastructure on the urban development of Fortaleza and the consequences on spatial justice, I will study the project of the 1st Ring Road, commonly known as ‘Via Expressa’ (Expressway).

In this case study I will investigate how the social justice principles reflect on the implementation of this infrastructure. The analysis will be discussed around two phases: firstly on the existing built part of the road, secondly on the on-going implementation of a light rail along the existing road. The first phase of the road was executed under the term of the directive plan of 1992, while the second phase is under the term of the current direct plan of 2009.

The analysis will be conducted by mapping the various dimensions of social life and its spatial distribution, following the discussion around the principles of social justice and their role on spatial planning and city development.

5 THE CASE OF THE 1ST RING ROAD
Map 5.1 1st Ring Road and road network
Source: Based on municipality cartography and LUOS 1996 (land use law)
5.1 A Highway Through the City

The history of the first ring road of Fortaleza begins with the story of the urban planning in Fortaleza. It was conceived within a radial-concentric strategy for urban development and expansion of the city of Fortaleza in the first propositive plan of 1933 (Redesign and Extension Plan of the City of Fortaleza). The plan proposes the ring as a way to connect the port located in the east side to the industries in the west side and is based on the use of automobile, introduced in 1910. (Muniz, 2006)

The project has been presented also in the following plans, with some location shifts, but no structural change. The objective of being an expressway for fast transit and large capacity for vehicles has been reinforced on each subsequent plan.

The road, however, only started to be executed in 1998 in the term of the major Juraci Magalhães. The beginning of the construction started in 1999 and in 2000 the major was re-elected and kept the construction going until its end on 2004. According to an employee at the Department of Infrastructure the major had a great influence in the development of transport infrastructures. It was also in his term, that the integration terminals were introduced to the bus system, a significant change for the public transport system in the city.

As in most of the political terms, majors or state governors, can determine which projects to carry forward, from previous terms or designed on their own terms. Therefore many important projects are kept shelved when there is a shift in authority.

As it is indicated in the directive plans the road should consists in a fast way road 60 meters wide and the existing train line should be in the middle of the section. The policies documents, since the first mention to the road, only defines its trajectory and refers to the land use law for technical definitions. The land use law provides the profile measures for the whole route without any account to its design or alongside land use.

Developed by the engineers of the Department of Infrastructure, the executive project of the road followed the recommendations and was developed for an expressway of 60 meters wide. However, the lack of urban control and implementation of the urban policies through the years resulted in a complete different city from the one envisioned in 1933. As discussed before, the rapid population growth of Fortaleza created a very large ‘informal city’ around the designed formal city.

The location for the road, where before were only dunes and a small fishing settlement, at the time of its construction was completely occupied. Hundreds of families have been settling informally there over the years, some from the fishing settlement expansion itself and others coming from other parts of the state in search of opportunities in the city.

Within this new reality many conflicts aroused with the attempt of the road construction. Many
people were displaced from their homes and communities were divided in different locations. Nevertheless, the implementation of the project had to change to minimize displacements, both due to people resistance, but also to reduce the costs of relocations and compensation. The municipality, responsible for the project had to take into account some of the objections and the construction was carried differently.

Instead of a 60 meters wide fast way, the road built has half of the proposed. It consists of one of the sides of the original project. However, the implemented project is not available at the Department of Infrastructure, perhaps it was adjusted only at the construction site, as the plans archived at the institution are the original design plans.

The 1st Ring Road (1° Anel Viario), or Via Expressa, has never worked as a fast road, or a ring road as envisioned. It has never worked as a fast way or an east and west bypass because its constructed part is about one quarter of the full 1st Ring Road proposal, therefore it does not connect the both sides of the city. And it was never a true fast way due to the crossings with the main perpendicular roads are made on the same level and with traffic lights.

The road being located in a rather occupied area prevented it of functioning as an expressway, even though there is still being desired and pursuit by the municipal authority and traffic planners. Despite the changes made at the time of the construction, and the narrowing down of the road profile, the implementation of such infrastructure had serious social and spatial effects on the local communities.

According to the residents of the area, the displacements were a very hard situation. People who had to be relocated consider they were not being compensated fairly for their homes. The amount received was very low thus unfeasible to acquire another property on the same area. The families who could remain had to deal with the negative impacts of having this large infrastructure very close to their houses without any other gains rather than better traffic connections. Among the main negative effects of this project, as pointed out by the residents, are the increased criminality, heavy traffic flow, car accidents, insecurity, air and noise pollution and lack of social facilities.
Fig. 5.2 View of the train tracks and informal settlements by the 1st Ring Road
Source: photo by R. Nascimento Rocha

Fig. 5.3 View of high-rise buildings on the 1st Ring Road
Source: photo by R. Nascimento Rocha
5.1.1 1st Ring Road Concept Evolution
Fig. 5.4 1st Ring Road timeline

1 Plan of Sabóia Ribeiro 1947
2 Redesign and Extension Plan of Fortaleza by Nestor de Figueiredo 1933
3 Plan of Hélio Modesto1963
(Source: Based on Muniz, 2006)

(Source: Fortaleza municipality)

5 Blueprint of the project of 1998
(Source: SEINFRA)
Fig. 5.5 View from the under construction tracks of the light rail
Source: Author
5.2 The Light Rail Project

For the World Cup games of 2014 in Brazil, Fortaleza as a host city for the games enter the called ‘world cup projects package’. The municipality together with the State government initiate the implementation of several mobility projects. Most of the projects have been for many years in the city’s agenda, therefore with the possibility provided by funding of World Cup, those projects were put into action.

The VLT Parangaba – Mucuripe is one of them and it consists in the implementation of a light train using the existing cargo train tracks from the Mucuripe Port to the bus terminal of Parangaba.

The project has been developed by the State government as part of the metro system project of the metropolitan region of Fortaleza (Metrofor). The Metrofor project, whose studies and initial plans were developed in the 80s, aims to deploy an efficient mass transport by upgrading in stages the existing railway system, and by integrating it with other modes of transport currently in operation. It should be developed in accordance with the Directive Plan of Fortaleza and the policies from the other municipalities of the metropolitan area. (Vieira, 2013)

It was first designed to use the existing cargo tracks and work on alternating schedules. However, according to the responsible for the project, the engineer Cyro Regis Castelo Vieira from the State Coordination of Infrastructure, the feasibility study done showed that the necessary frequency of trains to attend the volume of people demand is too high to have the tracks shared with cargo trains. (Vieira, 2013)

The project being implemented has two independent tracks alongside the existing train track. With this new project another set of important effects would take place in the area, especially considering displacements of the communities and new spatial barriers.

According to Vieira (20013), in the feasibility study of the project, there is a high demand in the area and for the year 2014, start operation proposed year, the demand on the peak hour would be of 12,800 passengers and there should be a total demand of 98,100 passengers a day.

The calculations made on his analysis considered mainly two methods: the volume of passengers of bus lines that have routes on the zone of influence of the rail line; and surveys with the users about the transition to this mode of transport.

According to a research made by the Brazilian Institute of Urban Law (IBDU) regarding the light rail project, the shift of users from bus to train is not certain, and would not occur as forecasted on the feasibility study. Another point the research arise is that the priority for urban transportation in Fortaleza would be in a different axis, from the periphery to the areas
2011 expected start of construction
1980 first ideas
2010 project design
2011 expected start of construction
2012 start of construction
2013 expected end of construction
mid 2014 50% concluded

60 million euro budget
92 million euro budget

Map 5.2 Bus and rail network with light rail project
Source: Based on municipality cartography and LUOS 1996 (land use law)
of income and jobs concentration, from the districts at west and southwest to the central areas.

Mechanisms such as public assembly, public consultation and access to information, emphasized on the Participatory Directive Plan of 2009, as ways of ensuring the society participation on the project process, were not carried in a satisfactory way. According to Henrique Frota, executive secretary of IBDU, the mechanisms are used mainly in a way to formalize the actions instead of truly allow the population to step in, criticize and alter the project.

The changes that the project received were made due to the pressure of affected communities. The State government did not provide open channels for discussion, as it should be its role and it is prescribed on the directive plan of 2009.

The most evident conflict arising with the implementation of the light rail is the high occupation of the “domain area” of the railway. According to the national law, a strip of 15 meters to each side of the railway line is considered non aedificandi.

The feasibility study estimates around eight thousand people along the line considering a total twenty meters wide strip. It also observes that the railway level crossings with the road system are at the same level and there is a frequent circulation of people on the tracks, referring this use to be more appropriated to a tramway system than a cargo train line.

Despite its vague and yet quite superficial measurements on the feasibility study, the project of the light rail has been put forward. Even though it recognizes fundamental effects on the local population it does not indicate solutions for the conflicts. It rather assumes the priority for the implementation of a public transport system aiming to relief the overload bus system, basically used by low income population, by displacing a large amount of low-income families to an area not served by the new rail system.

As Henrique Frota concludes, the light rail as a mode of transport is largely recommended, however it is important no evaluate the way the project is being implemented in this particular case. According to him, with the discourse of promoting mobility it is violating other rights. Due to its location, the requirement of a large amount of displacements and the use of compensatory measures that are not meeting the needs of these families and might lead to other problems for the city, the way the project is proposed today is completely inappropriate to the urban structure of Fortaleza.

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Fig. 5.6 The old Parangaba rail station
Source: Arquivo Nirez
In summary, the official information of the Parangaba - Mucuripe light rail given by the responsible for the project at the municipality infrastructure department is the following:

- 13km of route extension – 11.6km on ground level and 1.4km elevated.
- 10 passengers stations – integration with 2 bus terminals and 2 metro stations
- 12 trains per hour per direction – a train every 5 minutes and a total trip of 30 minutes long
- 766 passengers capacity per train – each composed by 4 carriages
- Vehicles with hydraulic diesel traction
- Initial budget of approximated 60 million euro (displacements costs not included)
- Current budget estimated on 92 million euro in June 2014 (displacements costs not included)

5.2.1 Conclusions

Not only is the announced volume of passengers to use the light rail per day highly questionable. Almost hundred thousand people a day for this route is very unlikely, considering the total amount of around a million passengers per day on the entire public transport of Fortaleza. In addition, the displacements and relocations of the informal settlements to remote areas not reached by the proposed light rail makes it even more controversial the assumption of that high amount of passengers. Especially in an area of the city mainly settle by medium to high income groups, which are not the main users of public transport.

The implementation of a system located in a rather occupied urban fabric and with the transit of trains every five minutes. Besides being costly it will bring important changes and consequences to the space. The existing cargo tracks are used until now by cargo trains crossing it only four times a day on a speed of 21km per hour between midnight and six in the morning. Today the tracks are not seen as a big barrier. The communities along the tracks live with the train without great problems. This situation will have a great shift with the introduction of the extra two rail lines, and due to the high frequency of the trains, the physical barrier will definitely have to be placed, as a matter of safety.
**Fig. 5.7** Sign with the project model  
*Source: Author*

**Fig. 5.8** View of Light rail construction  
*Source: google.com*
5.3 The Decision Process

Both the project of the ring road and the upcoming light rail consist fundamentally in a top down action. The designs of both projects were developed inside the municipal departments and the consultation and participation of the population were left out of the decision-making processes.

The project of the ring road was developed before the City Statute of 2001 and the Participatory Directive Plan of 2009, therefore the awareness of the importance of participatory processes were still very low. Basically the residents were only informed on the construction of the infrastructures.

According to the residents of the community Trilha do Senhor the actual project of the light rail was never presented to them. The community is located along the train tracks and it is now resisting to be evicted due to the light rail project. One of the strategies of resisting is not allowing the employees of the municipality to measure their houses for the demolitions. The channels of discussion with the public authorities were open only when the population resisted to the beginning of the construction, which was when they get to know about the project. There was not an opportunity to discuss the project on its design phase and perhaps achieve better solutions and compensations.

Therefore when we confront the processes of both projects, based on what was told by the local residents, and with the principles of social justice, we can conclude that inclusion and transparency where kept rather outside the decisions. The actions for consultation and participation of the projects, if they existed, did not include the most vulnerable groups being affected by the projects. As a result, in the case of the light rail, a great resistance is compromising the implementation of the project as it is designed now. Perhaps as well as it happened on the construction of the ring road, adjustments and changes will have to be made to the project in order to cope with the reality of the informal city.
Map 6.1 Area defined for the analysis - built part of the 1st Ring Road
Source: Based on municipality cartography
6 SPATIAL ANALYSIS

This chapter aims to analyse and evaluate the spatial consequences of the area affected by the implementation of the Ring Road and the new Light Rail. The analysis in based on the principles discussed on the second chapter, therefore it focus on the spatial justice aspects of the introduction of the 1st ring road in the urban fabric and the upcoming installation of the light rail along the road.

The analyses are developed through different scales: city, district (road length), neighbourhood (1x1km) and local (200x200m). This way it is possible to understand the spatial implications of such projects in different levels and the effects it has in different social groups. On the city level we can perceive the implication on the main connections and transport structures of the city. With the district scale, looking at the entire route it is possible to see the patterns and spatial effects along the territory it cuts through. Within the neighbourhood scale the objective is to highlight the local qualities, uses and typologies, to be able to perceive the qualities of the space in a local section (200x200m) and test an alternative.

The aim of this analysis is to draw a spatial cost and benefits evaluation of the implementation of these infrastructures. The actual objectives of these projects are frequently blunt and not explicit, especially when it comes to the smaller scales. The effects on neighbourhoods and at local levels are very high and the relation between the costs and the claimed benefits of connection and accessibility might be unbalanced for some groups.
Map 6.2 Income spatial distribution by district
Map 6.3 Population Density by census tract
Source: Based on municipality cartography and IBGE census 2010
6.1 Overall Social Pattern

In order to assess the impact of this infrastructure on spatial justice, first it is important to understand the spatial distribution of income, mapping where the different social groups are located. In that way it is possible to visualize the ones more affected by the project, in terms of displacement, environmental disturbance, as well as the benefits they might receive.

The map on the side shows how this area is rather mixed in terms of wealth. The presence of a large area of informal settlements in such a central and high value part of the city is remarkable. Those communities were able to remain in the area, and due to the new planning policies will be able to remain on the Special Zones of Social Interest (ZEIS), as explained in the fourth chapter.

As we can see in the map, the road tends to work as a dividing element, in this case, it makes a division of the social groups as it makes a clear separation of the wealthiest districts on the west to the less dense and of later occupation areas on the east of the road. It is also on the east side that we see the presence of more informal settlements.

This area of the city is densely occupied as we can see on the map. Even though it is an area of great verticalization, the higher levels of density coincide with the informal settlements. The typology of these informal settlements is exclusively attached houses with no more than two floors where commonly more than one family live. A large number of family members share a limited space, as the family grows and the second generation remains in the house or build an extension on the house.

These settlements, still considered officially as informal, have been there for around 40 years. Each community has their story and their drive force of occupation. Whether it is a fishing community, as the one on the north close to the coast, or migrants from the countryside pursuing better opportunities in the city. All these communities made wrote their story on this location.
6.1.1 Typologies

The districts closer to the central core have the more dense areas and the typologies on those areas of the city had been replaced through time, following the need for increasing the number of households. The city housing typologies in the early years were basically detached houses and small buildings, the colonial houses were later replaced by three stories buildings that have been replaced on the last two decades by twenty two stories buildings, maximum height allowed in the central areas.

Map Legend

- commercial axis
- informal settlements
- detached houses
- semi-detached houses
- apartment blocks
- high-rise apartment buildings

Fig 6.1 View of different typologies along the road
Source: Author
Map 6.4 Building Typologies
Source: Based on municipality cartography and Google street view
6.2 Impacts on Housing Displacements

The action of displacement and remote relocation of a large number of families has been happening constantly in the process of development of Fortaleza. The location of this study is very particular due to the remaining informal communities in the area. It shows a mixed occupation of the space by different social groups and that is seen as an important element for ensuring diversity.

Therefore an important approach to this problem is to enable these communities to remain in the area, reinforcing their bounds and their connection to their neighbourhoods. The use of urban voids for new settlements and densification of the existing ones can be solutions to keep the population in the area, allowing relocation within the same neighbourhood. It is beneficial also at the levels of the district and the city to have more diverse neighbourhoods, not only regarding mixed uses but also of mixed social groups.

The special zone of social interest is a strategic tool to be used. Bringing the concept of the zones forward by proposing development and betterment of the settlements, such as improvements in the households, replacement of inappropriate units with social housing. Also, by including the informal communities that are outside the special zones and giving them the possibility to become formal and benefit from better housing conditions as well.
Map 6.7 Housing Displacements
Source: Based on cartography and aerial photos from the municipality
6.3 Fragmentation Effect

An infrastructure of such scale can provide a rupture on the urban fabric. This ruptures often separate communities and performs as a spatial barrier. In this case the implementation of the road divided the informal communities that were situated alongside the train line. The train line, due to its low frequency, was a minor division than the wide road constructed. This physical barrier will increase immensely with the implementation of the light rail. A fence will be placed along the route to protect people from accidents due to the speed and frequency of the trains.

Another important aspect of the spatial analysis considered the permeability of the road and how is the interaction between the infrastructure and the areas along it. The map shows different levels of interaction: low interaction when the connection is made by a wall with no entrances; medium interaction when the walls have entrances and the interaction is limited to the circulation and access of vehicles to the buildings; and high integration. The high integration, found mainly where there are informal communities, refers to a greater connection between the buildings and the road, where often there are not walls and the residents also uses the space of the street as an extension of their houses.

Fig. 6.2 Cyclist crossing the light rail tracks
Source: extracted from the documentary "Veículo Pesado sob as comunidades dos trilhos"
Map 6.8 Road Permeability
Source: Based on municipality cartography, aerial photos and Google street view
6.4 Road Structure

As a large-scale piece of infrastructure, this road has very few crossings in an attempt to allow fast flow. It has four ground level crossings with traffic lights, allowing pedestrian crossing and four crossing in different levels, in which it performs as a viaduct with the secondary roads passing below.

Apart from the crossings with traffic light, the structure of the road does not allow safe pedestrian or bicycle crossings. From the point of the motorized modes of transport, the project did increase the connection north and south in that area, and allowed the faster circulation of vehicles. However, the access from the crossing roads is also limited due to the freeway profile.

The accessibility improved by the implementation of the road gave more opportunities for the residents in the area, such as better access to jobs, however the public transport service remained poor. The light rail is introduced to tackle this issue, and intends to provide mass transportation for around 90 thousand people a day. Its main argument is the integration with two metro lines and to the two main bus terminals of the city. The way this integration will happen is not clear and the detailed project does not demonstrate it.
Map 6.9 Road Structure
Source: Based on municipality cartography, aerial photos and Google street view
6.4.1 Road profiles

Fig. 6.4 Road Sections
Source: Based on municipality cartography, aerial photos and Google street view
6.5 Open and Public Spaces

The availability of open spaces is a very important issue of the urban development in Fortaleza. The rapid growth and low concern on the protection of green areas and public spaces in the past resulted in a very dense and highly built city. Another important trend should be also considered, the escalating privatization of public goods. The wealthiest groups do not rely on the public sector for recreational areas, health care, educational facilities and security services. By the increasing of private and behind walls facilities, the public space has been reduced to few areas, leaving basically the environmental protected areas and road network as the remained open public spaces of the city.

Nevertheless, lower income populations are still counting on the public facilities. Even though as the majority, unfortunately the provided facilities are very scarce and low quality in Fortaleza.

The importance of public spaces when the built environment is also very restrict, such is the case of that part of the population, is even higher and a very important element to foster spatial justice in the city.
Map 6.10 Open and public spaces
Source: Based on municipality cartography, aerial photos and Google street view
There are very few public spaces meant for leisure activities. As show in the pictures, small squares are provided by public investments, more often close to low-income communities. The most democratically used space in the city is the beach. It has a large promenade in the central section.

Despite the dominance of higher income households along the promenade, due to the value of the land, the use of the space is rather mixed and inclusive and different groups coexist and share the space. This area is the main place for open concerts and free activities.

The project of the ring road, in its first phase, did not include the provision of new public spaces neither enhance and integrate the existing ones. The road profile itself does not provide space for social gatherings or even a pedestrian friendly environment, a lost opportunity on adding living quality benefits with such a highly cost public investment. On the map, we can observe that the line links the main natural areas of the city, the park and the beach, therefore it has a great potential of working as an integrating line of public spaces, instead of a division and barrier between spaces.

### 6.5.1 Recreational spaces
Map 6.11 Recreational spaces
Source: Based on municipality cartography, aerial photos and Google street view
6.7 Analysis Conclusions

Assessing spatial justice and what are the effects of infrastructure on this matter is a difficult task. The evaluation of who wins and who loses and what are the costs and benefits that such implementation might cause it is rather complicated to measure.

The findings are mixed, the road as a transport infrastructure succeed to provide better accessibility at the city level and district level, but not at the local level of the neighbourhood. Cars users are the main beneficiated by the road is it was built. The traffic flow is improved due to the large size and number of lanes, however the road is shared by cars, trucks and buses. The bike lane placed in the middle of the road it is another downside for the bicycle users. Despite it might being safer for the cyclist as it does not have many crossings, it can be difficult to be reached at first and the cyclist is disconnect of the urban uses along the street being restricted to a certain high speed bicycle path.

The street wide profile makes feasible to incorporate other modes of transport, such as rail systems. Putting in public transport, as the project of the light rail, it is an important initiative. There is a demand in the area for the service and the city surely is deficient in mass transportation.

Therefore, the introduction of such public mode of transport would bring large benefits for the area and for the city as whole. However, the way the projects are bluntly detailed and poorly executed they do not seem to take into account the population directed affected, their life styles, social bounds, physical and social environments. Neither it is considered which is the true appropriated transport solution for the area.

Despite the spatial barriers and poor environmental qualities provided by the projects to all residents along the road, the consequences on the life of the poorest communities are the most relevant aspect from the social justice perspective.

In a vulnerable position, the displacement of those communities not only disbenefit them as it also brings other problems to the city in the long run, such as segregation and lack of diversity, resulting in unsafe higher income clustered neighbourhoods.

Would it be possible to fit in this large-scale infrastructure in a more spatially just way?

The table 6.1 shows the approach that is taken in this work, translating the principles of social justice and the results of the analysis into a strategy and a set of actions that could bring to alternatives that will produce a better distribution of costs and benefits.
### 6.7.1 From principles to actions

<table>
<thead>
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<th>ANALYSIS</th>
<th>SCALES</th>
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<td>NEIGHBOURHOOD 1x1KM</td>
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<td>enable transparent decisions in planning</td>
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<td>prioritize interests of local dwellers and vulnerable groups</td>
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**Table 6.1 From principles to actions - defining the strategy**

Source: Based on the literature review and spatial analysis
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<td>restrict large-scale development in specific areas</td>
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<td>activate urban voids for low-income housing and relocations</td>
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<td>EMBRACING THE COMMUNITIES</td>
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<td></td>
<td>promote pedestrian and bicycle friendly environment</td>
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<td>prioritize public transport</td>
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<td>ACCESSIBILITY AND PERMEABILITY</td>
<td>create and maintain green areas for recreational use</td>
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<td></td>
<td>integrate and enhance existing public spaces</td>
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<td>CHECK AND BALANCES</td>
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**SPACE**
- local scale

**SPATIAL JUSTICE**
Fig. 7.1 View of informal houses along the train line
Source: envolverde.com.br
7 AN ALTERNATIVE APPROACH

In this chapter I will bring the findings of the spatial analysis forward, in order to encounter potentials and possibilities for alternatives to the projects presented. Using the guiding principles of social justice the, aim is to make the spatial potentials into strategic actions that could help achieving local spatial justice.

The principles, as discussed previously on theoretical framework, are translated into recommendations for the spatial actions and are defined to guide the approach to space and to be used to evaluate the spatial actions.

The aim is to propose an alternative that could deliver the same objectives of the road and light rail project, but the cost and benefits would be better balanced. Without losing the benefits that a transport infrastructure project might bring, some other ways of intervening could produce better balance of results.

The proposals are based on the potentials of the area and guided by the main principles of equity and diversity, the social function of the property and the role infrastructure can play to enhance public realm. Placing the potentials of the area into strategic actions
7.1 STRATEGIC POTENTIAL

In this section I will define the strategic actions that could be taken on the scale of the whole line. Taking the potentials and qualities that can be find along the road, the diversity of uses and typologies to design an strategy for the infrastructure as a whole.

The main objective is to make a proposal that would use this piece of infrastructure fit in the fabric more sensitively, functioning as a integrating element rather then a division, providing opportunities and quality spaces to the groups along it.

7.1.1 Embracing the communities

The action of displacement and remote relocation of a large number of families has been happening constantly in the process of development of Fortaleza. The location of this study is very particular due to the remaining informal communities in the area. It shows a mixed occupation of the space by different social groups and that is seen as an important element for ensuring diversity.

Therefore an important approach to this problem is to enable these communities to remain in the area, reinforcing their bounds and their connection to their neighbourhoods. The use of urban voids for new settlements and densification of the existing ones can be solutions to keep the population in the area, allowing relocation within the same neighbourhood. It is beneficial also at the levels of the district and the city to have more diverse neighbourhoods, not only regarding mixed uses but also of mixed social groups.

The special zone of social interest is a strategic tool to be used. Bringing the concept of the zones forward by proposing development and betterment of the settlements, such as improvements in the households, replacement of inappropriate units with social housing. Also, by including the informal communities that are outside the special zones and giving them the possibility to become formal and benefit from better housing conditions as well.
Map 7.1 Informal settlements and urban voids
Source: Based on municipality cartography, aerial photos and Google street view
7.1.2 Enhancing public spaces

The provision of public spaces is an important factor of the life in cities like Fortaleza, especially when one is not capable of benefit from private facilities. It is role of public sector to supply public goods and its access by the community.

The use of the space of the street as a public space consists in the second main action to enhance the public realm and improve the availability of open and public spaces.

The infrastructure development should enhance and integrate existing public spaces taking advantage of the potential of green and vibrant used areas. A system of public open spaces can be fostered with the new development, especially when it incorporates flows and means of transportation together.
potential for public space use
protected natural areas
poor public spaces
adequate public spaces

Map 7.2 Potential for public spaces
Source: Based on municipality cartography, aerial photos and Google street view
7.1.3 Permeability

Spatial barriers tend to divide communities and promote social exclusion and fragmented spaces in the city. Transport infrastructures due to its scale are one of the main barriers of the urban fabric. It is important to consider ways of building them more embedded in space therefore more permeable and accessible.

Secondary and intersecting roads as well as some focal spaces can be opened to the road to facilitate its perception while opening some of the closed walls and turning the views toward the road.
potential for improved accessibility and permeability of the road

Map 7.3 Permeability potential
Source: Based on municipality cartography, aerial photos and Google street view
7.1.4 Accessibility

The light rail proposes an alternative mode of public transportation, which is a very important and necessary step on the development of Fortaleza. The metro in Fortaleza is just being realized, and the use of a train on the surface would provide more capacity of passengers than a bus and less investments costs as a metro line. Therefore it is relevant to take this idea forward. However as argued through the analysis, the choice of a rather fast and frequent train in a highly urbanized area, dividing the same space with other vehicles and people is not appropriated, and neither is the use of physical barriers desirable to the users and residents.

Therefore, the potential of the road to carry public transport allows the implementation of a tramway, which intentionally shares the space with traffic and people flows. Since its speed is reduced and the safety provide, this alternative can bring several benefits as it will be more easily accessible and the implementation of more stops might increase gathering areas and social interaction.

Another relevant aspect is the social stigma that public transport carries in Fortaleza, especially the bus use. The society still relies on out-dated standards that have been developed under cultural references based on the idea of car as an indication of status. Ceará is the state in the northeast region with the largest market for luxury cars. It has over 30% stake in sales of luxury vehicles. Thus, the introduction of a mode of transport such as the tramway, which provides more comfort than the bus and resembles to the metro, which in Fortaleza is largely associated to European cities, could also attract car users.

The profile of the road allow the introduction of an exclusive space for public transport, either on tracks or as a bus rapid transit system (BRT). Even though the implementation of a bus rapid system is faster and cheaper than the construction of rail tracks for the use of a tramway or a light rail, the long-term benefit of the rail transport may overcome the initial investment.

The study for the construction of a tramway in Montpellier (France) demonstrates the main differences between tramway, BRT and metro (Tourneur, 2010). Certainly we cannot direct translate the numbers to the Brazilian context, but it is possible to understand the reasoning and measure the pros and cons of each mode of transport.

According to Tourneur (2010), the total investment cost (infrastructures and vehicle) is two to three times higher, but the operating savings permitted by the high capacity of the trains and the efficiency of the railway vehicles offset the extra cost of investment, over the entire depreciation term. The capacity of the vehicles, the total investment cost per kilometre and the operating cost per kilometre-travelled places the tramway between bus and metro system. Which means, that the tramway could be a strategy for a transport system that could be faster and transport more people than articulated buses, but would cost less than the metro.

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Map 7.4 Public transport potential
Source: Based on municipality cartography, aerial photos and Google street view
7.1.5 Guiding development

Taking advantage of the potentials provided by the implementation of a tramway and the provision of good public spaces, the area would be target for developers, as it has constantly happened in other areas of Fortaleza.

Therefore a great strategy is to give direction to how and in which particular places developments should be stimulated. In a way it would not contribute to disbenefit those who are worst off, and instead could provide them better opportunities. Grasping the potential of development to provide better facilities, shopping, employment opportunities, and so on, as well as protecting some areas from undesired commercial development and concentrating it in preferred areas around the transport nodes and where there is already a tendency of commerce and services.

As the map shows the area around the main transportation node, integration of metro, bus terminal and proposed tram stop, would have a larger radius for commercial development of one kilometre, whilst other tree areas around other important points have 800 meters of influence and the local, resident areas can concentrate around the tram stops smaller scale facilities.
Map 7.5 Economic development potential
Source: Based on municipality cartography, aerial photos and Google street view
7.2 TOWARDS A JUST OUTCOME

These actions interlinked and they define a strategy to transform this line into an integrating element that could provide better chances on promoting inclusion and spatial justice.

The strategy was conceived taking the whole extension of the line and it is based on the potential of this road and the project of the light rail to address the spatial principles defined for a more sensitive and inclusive infrastructure.

The strategy will to be tested in two case studies. The intension is to define the objectives and measures in the larger scale and test it in the local scale, as the consequences and impacts are most perceived on this level, on the living qualities that the environment provide.

The first case of study is located at the beginning of the road and the tramway. It is an area with a large informal settlement and most of it is inside a special zone of social interest.

The second case study is located in the area close to the bus terminal and future metro line station, and it has a large informal settlement that is not included in any special zone. This community has been resisting to the evictions of the light rail project, therefore an important approach for an alternative, is providing a possibility for social housing development within the neighbourhood.
Map 7.6 Strategic Potentials
Source: Based on municipality cartography, aerial photos and Google street view
Fig. 7.2 Location case 01
Source: Based on municipality cartography
This area is called Mucuripe, it has the same name of the port and it is also the name of this part of the coast. The community of Mucuripe starts settling closer to the coast, as it was mainly formed by fishermen and their families. The coastal area was surrounded by beautiful dunes, typical landscape in the coast of this region. Over time this dunes started being occupied by these families and other people coming from different parts of the State.

The expansion of the city initiated towards the west side of the city, therefore this area was kept rather vacant for some time, allowing low income groups to settle there informally. The community grew together and became a strong and cohesive neighbourhood, however still separated of the formal city, stigmatize as a favela.

Today, apart from the informality, most households of this settlement are in better conditions than many of the informal settlements in Fortaleza. Especially in the areas along the road, the informal houses have good structure and all of them have access to water, sewage, and garbage collection. However, with the implementation of the road the houses suffered from environmental impacts and living quality losses. The wide traffic infrastructure brought noise and air pollution and restricted the public use of the street. The streets in some neighbourhoods in Fortaleza are still used as a public space, as it was very common in the early years. People often put their chairs on the sidewalk and use it as a gathering place in the evenings and weekends. This use of the street as an extension of the house is mainly seen nowadays in lower-income districts and informal settlements neighbourhoods.

An alternative to this area would have to consider the lack of public spaces and green areas. Taking them as an important factor to the improvement of the living conditions of these populations that are living in such limited private spaces.

7.3 CASE 01: COMMUNITY BOULEVARD
Fig 7.3 Case 01
Source: Fortaleza Municipality - aerial photo 2010

Map 7.7 Open and recreational spaces - case 01
Source: Based on municipality cartography, aerial photos and Google street view

Map 7.8 Open and public areas - case 01
Source: Based on municipality cartography, aerial photos and Google street view

Map 7.9 Formal and informal settlements - case 01
Source: Based on municipality cartography, aerial photos and Google street view
7.3.1 Space potential

As mentioned before, the analysis is made through scales, and in the local level we look into the space searching for the potential and qualities that can be enhanced in the local level. Defining how the principles can be spatialized.

The following maps show how the area is served by public facilities and which are the main elements that form its character. Which are the presence of a large informal settlement the availability of few public spaces and a lack of permeable and accessible open areas.

The provision of public transport is also relevant to define the appropriate mode of transported to be suggested in the proposal, as well as the location for the stops and the land use that might be affected.

Fig. 7.4 Case 01 3D view
Source: Google Earth in 2014
Map 7.10 Displaced Houses and New Buildings - case 01
Source: Based on municipality cartography, aerial photos of 1995, 2004 and 2010

Map 7.11 Pedestrian accessibility - case 01
Source: Based on municipality cartography, aerial photos and Google street view

Map 7.12 Directive Plan Zoning - case 01
Source: Based on municipality cartography and PDP 2009

Map 7.13 Public transport network - case 01
Source: Based on municipality cartography and ETUFOR
Fig. 7.5 View of the light rail tracks
Source: Author

Fig. 7.6 View of the road profile
Source: Author
Fig. 7.7 View of rail tracks and informal settlements
Source: Author

Fig. 7.8 View of the 1st Ring Road profile
Source: Author
7.3.2 Test location - case 01

The analysis made on the scale of one by one square kilometre it is tested in a local scale of 200 by 200 meters. In this scale it is possible to see the implication on space that a different solution might bring to the neighbourhood.

The intention of this small test is to provide an alternative that is more embedded in the spatial and social conditions of this particular area.
Fig. 7.10 Plan of existing situation - case 01
Source: Based on municipality cartography and aerial photo 2010

Fig. 7.11 Section of condition before the construction of the 1st Ring Road - case 01
Source: Based on municipality cartography and aerial photo 2010

Fig. 7.12 Section existing situation - case 01
Source: Based on municipality cartography and aerial photo 2010
7.3.3 Current condition

This road, as already described, have three main phases. The first one as showed in the section below was before the construction of the ring road. The section on the bottom, shows the second phase after the displacements of a high number of households. The third phase, still underdevelopment, will be with the implementation of the light rail.

The plan on the side shows the existing situation of the case study area. The main aspects we can highlight at first are the available public spaces currently in poor conditions, the existence of a vacant land, and the poor offer of green areas and trees.

Fig. 7.13 Road profile and rail tracks - case 01
Source: Author
Fig. 7.14 Plan of light rail proposal - case 01
Source: Based on municipality cartography, aerial photo and project information available

Fig. 7.15 Section of light rail proposal - case 01
Source: Based on municipality cartography, aerial photo and project information available
7.3.4 Light rail proposal

This plans shows the area as it is now with the implementation of the light rail as its proposed by the government. With the implementation of other two rail tracks the barrier is consolidated. According to the infrastructure department, to ensure the safety of the population the protection along the line will be made with the use of metal fences instead of walls.

The use of protection is necessary and even though they are transparent the barrier effect is inevitable with the implementation of this infrastructure on this particular proposal. The project presented by the state government consists basically in the 3d model of the stops as (fig. 7.160 and the map with the trajectory line. The detailed plans and sections are not broadly published, even though the construction is already quite advanced.
Fig. 7.17 Alternative proposal plan 1st phase - case 01
Based on municipality cartography and aerial photo 2010

Fig. 7.18 Section of alternative proposal 1st phase - case 01
Source: Based on municipality cartography and aerial photo 2010
7.3.5 Alternative proposal - 1st stage

The first step of an alternative solution for this project is to consider in which way the public transport would fit in the line. The solution presented here suggests the implementation of a tramway in the middle of the road section. This approach aims to minimise the barrier effect that a transport line could bring if being placed on one of the sides, where the buildings of one side can be less integrated with the other side.

The priority for the tramway, reduces the area for the cars on some crossings where the tram stops are located, slowing down the traffic to make it safer for the pedestrians and cyclists. An important element of this proposal is the increase on pedestrian area and more appropriated location and size for the bike paths, connecting them to the uses along the road.

This alternative proposes the renovation of the existing public spaces with new furniture for different uses, integrating them through pavements and elevated crossings. The increment of green areas, especially trees to cope with the warm weather of the city. And the use of the urban void for a housing development to attend the housing deficit of the city and the necessary relocations from the risk areas by the river.

The new housing development should come to contribute to a more integrated space, without walls and with open and green areas for its residents but also for the neighbourhood.

Fig. 7.19 Visualization of alternative proposal 1st phase - case 01
Source: Based on municipality cartography and aerial photo 2010
Fig. 7.20 Alternative proposal plan 2nd phase - case 01
Based on municipality cartography and aerial photo 2010

Fig. 7.21 Section of alternative proposal 2nd phase - case 01
Source: Based on municipality cartography and aerial photo 2010
7.3.5 Alternative proposal - 2nd stage

The proposal is based firstly on the idea that the cargo train could remain working in the area as it does today, few times a days in late night hours. Over time, the port will likely shift his activities to the bigger and more important port outside the city (Porto do Pécem), thus the frequency and need of this cargo line might be lost, which means the area today used by this infrastructure could become available.

The second stage of the proposal suggests the activation of this available land by defining the use of some areas for the existing commercial/mixed use buildings that now have their front to the street behind. By doing that we can allow this building to have their fronts to the boulevard, increasing the integration between building and road public spaces, thus the vitality of the area. The semi-private terraces are alternated with open areas with trees and benches for the recreational use of the residents. The areas defined on the corners of the new street are meant for more intense activities such as skate parks and sports facilities to attend the population of the new housing development.

Fig. 7.21 Visualization of alternative proposal
2nd phase - case 01
Source: Based on municipality cartography and aerial photo 2010
Fig. 7.22 Public squares - case 01
Visualization of how could be the renovation of existing squares.

Fig 7.19 Bike lanes and sidewalks - case 01
Bicycle and pedestrian priority. Bike lanes integrated to the uses and under the shadow of the sidewalk trees.

Fig 7.20 Urban furniture - case 01
Use of the level difference for urban furniture. Steps for diverse uses.
AN ALTERNATIVE APPROACH

Fig 7.21 Intersection - case 01  
Visualization of the proposal on the 1st stage with the train still working.

Fig 7.22 Intersection 2nd phase - case 01  
Visualization of the proposal on the 2nd stage with the activation of the space along the train tracks.

Fig 7.23 Urban furniture - case 01  
Top view of the proposal on the 2nd stage. On the back in yellow we can see where the area for social housing would take place.
Fig 7.24 Comparative evaluation of the spatial changes in the use of space - case 01
Source: Author
7.3.6 Project evaluation

If we compare the sections on the side page we can conclude that the main gain with this proposal is the pedestrian use, the availability of space for the people rather than the automobiles. Even by including a exclusive public transport space, the street remains providing connection and flow to the cars, even though the traffic might be slower, it still can be steady and the flow of people transportation can be compensated by the higher number of passengers transported by the tramway.

The gains on quality of life provided by the new proposal, such as better environmental comfort by the increment of trees and green coverage, as well as a likely more safe neighbourhood with more people using the street and public spaces, are very difficult to measure quantitatively. Yet, it is fundamental to emphasize their importance on the construction of a city more spatially fair and for better living conditions.

<table>
<thead>
<tr>
<th>GUIDING DEVELOPMENT</th>
<th>mixed use in the areas closed to public transport stops</th>
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<tbody>
<tr>
<td></td>
<td>restrict large-scale development in specific areas</td>
</tr>
<tr>
<td>EMBRACING THE COMMUNITIES</td>
<td>activate urban voids for low-income housing and relocations</td>
</tr>
<tr>
<td>ACCESSIBILITY AND PERMEABILITY</td>
<td>improve special social interest zones living conditions</td>
</tr>
<tr>
<td>RETAINING THE PUBLIC SPACES</td>
<td>promote pedestrian and bicycle friendly environment</td>
</tr>
<tr>
<td></td>
<td>prioritize public transport</td>
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<tr>
<td></td>
<td>create and mantain green areas for recreational use</td>
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<td></td>
<td>integrate and enhance existing public spaces</td>
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<td></td>
<td>the road as a place to stay</td>
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<tr>
<td></td>
<td>- stimulus of mixed use and small commercial areas by the improvement of the public spaces and the activation of the voids.</td>
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<td></td>
<td>- definition of an vacant area for social housing development</td>
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<td></td>
<td>- better living condition with the provision of quality the public spaces</td>
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<td>- enlargement of the sidewalks and better bike lanes</td>
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<td>- tramway with exclusive space</td>
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<td></td>
<td>- high increase on the number of trees on the sidewalks and public squares and of green areas on the activation of the train domain space.</td>
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<td></td>
<td>- improvement of public areas and integration of the them through same level sidewalks.</td>
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<tr>
<td></td>
<td>- the road becomes a integrating boulevard and inclusive public space</td>
</tr>
</tbody>
</table>

Table 7.1 Evaluation - case 01
Source: based on literature review
Fig 7.25  View of existing situation - case 01
Source: Google Earth
The main objective of this proposal is to apply the principles of social justice into the space. Using the principles as a guide for the actual physical consequences of a transport infrastructure project.

The proposal does not aim to achieve an ideal situation for all the challenges around these projects, however it tries to give an alternative that might provide better living qualities for the residents along the road, specially the ones in vulnerable situation, and contribute to the city's social cohesion.

In the image below it is possible to see an possible alternative for this area, with the implementation of project to benefit a larger number of social groups and yet a proposal that does not require the relocation of current residents. The project proposes a look also at the small scale when addressing a problem in the large scale, prioritizing the collective over the individual.

Fig 7.26 Visualization of proposal - case 01
Source: Based on Google Earth
Fig 7.27 Location case 02
Source: Based on municipality cartography
The second case of study takes an section of the road where there is a large informal settlement and it is also subject of increasing land value and large commercial developments. The occupation has been settled in the area for about 40 to 50 years, and since they are not part of a special interest zone their eviction is been required for the construction of the light rail.

The greater potential of this section is the possibility of a diverse use of the space, mixed land uses and more importantly diversity of social groups, as the informal settlement is surrounded by different income groups.

The main goal of an alternative for this area should embrace the opportunity to kept the community in place, helping the city to achieve equity and diversity by stopping the process of gentrification.
Map 7.18 Land Use - case 02
Source: Based on municipality cartography, aerial photos and Google street view

Map 7.19 Open and public spaces - case 02
Source: Based on municipality cartography, aerial photos and Google street view

Map 7.20 Displaced Houses and New Buildings - case 01
Source: Based on municipality cartography, aerial photos and Google street view

Map 7.21 Pedestrian accessibility - case 02
Source: Based on municipality cartography, aerial photos and Google street view
7.4.1 Space potential

The maps show the early process of displacements and the remaining parts of the settlement after the construction of the road. The area lacks public and open spaces. Basically the streets are the only public space available. The area is becoming more and more commercial with large-scale new typologies replacing the small scale buildings.

As we can see in the pictures on the next pages, the area of the train tracks is used as car parking, public space and bikeway. And the railroad crossings are very poor.

Fig 7.28 View of area of study - case 02
Source: Google Earth
Fig 7.29 View of railroad crossing - case 02
Source: Author

Fig 7.30 View of use of sidewalks - case 02
Source: Author
7.4.2 Test location - case 02

In this second case of study, a smaller area is defined for a design test alternative. The area is 200 by 200 meters. This particular section consists in the area of the informal settlement in one side and the presence of large new developments in the other side of the road. In this square we have a great potential for action where the principle of diversity can be fostered.

In this part of the road, differently from the first case, the informal settlement is confined to a smaller part of the neighbourhood. Therefore, the pressure for the community eviction is higher also due to the poor integration of the community residents with the others of residents with rather higher income.

Fig. 7.31 Case 02 - 200x200m test location
Source: Based municipality cartography
Fig 7.32 Test location - case 02
Source: Google Earth
7.3.2 Alternative proposal

The proposal for this case study uses the same road profile of the first case, incorporating the tramway in the middle of the road and the bike lanes along side. The main difference on this case is the proposal of providing formal housing alternative in the same location for the informal community. The project suggests the re-development of part of the settlement in block of two stories to accommodate all the families and provide collective space in the ground floor, for recreational activities and more permeable space.

In this proposal another street is created to give better connections through the blocks following the formal grid design of the city. Closer to the tram stops, the programme would provide mixed use buildings (highlighted in the visualizations in yellow), and stimulate the local commercial activities to the neighbourhood.
Fig 7.34  Proposal 1st phase - case 02
Visualization of the proposal with the new development and the train still working

Fig 7.35  Proposal 2nd phase - case 02
Visualization of the project in the 2nd phase with the activation of the space of the train for public use.
Fig 7.36 Introduction of tramway and bike lanes - case 02
Visualization of the proposal with the implementation of bike lanes and the tramway

Fig 7.37 New open and public space - case 02
Visualization the bike lanes and the tramway and the gain of more open and public space
Fig 7.38 The road as a public space - case 02
Shared use of the road, priority to public transport and availability of green and open spaces.

Fig 7.39 Pedestrian and cyclist space - case 02
Priority to pedestrian and cyclists with the increment of space and reduction of space for cars and traffic speed.
The aim of this intervention is to provide more public spaces and allow the diversity of uses, to large and small scale developments, as well as the coexistence of different social groups in the same neighbourhood. Integrating the uses and opening the buildings to the street as collective space.

This particular area of the city it is rather dense and this proposal just by providing more space, before occupied by the train tracks, with green in it would improve the quality of life of the residents of the neighbourhood, and also it could give the city another recreational space.

The proposal for the housing development follows a strategy been developed by the public sector in other areas of the city - the relocation of the residents of such communities to apartment blocks of two story in the formal city - however, in this proposal the resettlement is made in the same location, instead of moving this families to the periphery of the city.
Fig 7.40 View from the window of a house by the road
Source: Author
From the conclusions of the analysis, especially the ones from the design research, it is possible to look back on the planning sphere and think what from the knowledge acquired in the analysis we can apply.

Based also on the theory and principles of social justice, right to the city and how to provide more socially-spatial cities the proposal is to define recommendations and planning principles that can be added to the existing instruments in order to address the issues discussed through this work.

The decision making processes is a very important but one of a number of facets of the production of large scale infrastructure. As the complexity of the problem became apparent, this work finally concentrate on examining the consequences and demonstrating the possibility of spatial alternatives. Yet, In this chapter I initiate the discussion around possibilities for the decision making processes, but further detailed investigation is needed.
Particularly after the implementation of the City Statute and the elaboration of participatory
directive plans, several legal statements proposing participative decisions on public policies
were developed in Brazil. However, despite the existence of those regulations, large-scale
infrastructural projects often lay outside the agenda. The current planning tools remain
conflicting with the attempt to include effectively non-governmental participants in crucial
decision-making.

Since the early 90s, the debate around urban management in Brazil has been characterized
by contrast between management and participative-democratic models (Frey, 1996). Due to
globalization, the implementation of the neoliberal model and the increasing demands for
participation by the civil society, important changes have taken place around the concept of
urban governance.

There is a substantial change in urban policy, from principles based on the state authority to
governance approaches. New trends indicate a shift towards more shared and collaborative
management that involves the public sector, the productive sector and the increasing third
sector.

Governance becomes a more relevant topic due to consequences of neoliberal policies of
the past two decades. The shrinkage of the state and the inability of the weakened public
institutions to deal effectively with growing urban problems contribute to the discussion
of governance both due to the administrative perspective as under the social and political
emancipation point of view. Therefore it is possible to distinguish between the discussions
about governance that emphasize the main objective of increasing government efficiency and
effectiveness, and others that primarily focus on the democratic and emancipatory potential.
(Frey, 2007)

8.1.2 Participation in Fortaleza

Currently, the process of participation is defined by the directive plan. The plan indicates
different levels of participation, such as public audiences, debates and public consultation.
The policy makes clear the objective of having a more effective involvement of the population,
however remains quite broad on the ways of achieving it. Even though, it mentions the
participation also on the level of projects. The participation processes in Fortaleza, have been
more successful on the elaboration of the urban policies, such as this directive plan.

The Directive Plan of 2009 states:

Article 286 - Creates the Municipal System for Urban Development and Democratic
Participation by establishing democratic and participatory structures and processes,
which aim to allow the development of a continuous, dynamic and flexible process of planning and management of urban policy.

Article 287 - The objectives of the Municipal System for Urban Development and Democratic Participation are: I - establish channels for society participation in municipal management of urban policy; II - seek transparency and democratization of decision-making processes on matters of public interest; III - establish a continuous and systematic process of public discussion for detailing, updating and revision of the course of municipal urban policy and its basic instrument, the ‘Plano Diretor’; IV - to act in the formulation, implementation, evaluation, monitoring and review of policies, programs, projects and actions concerning to planning and urban management with their respective strategies and instruments.

Regarding the Instruments of Popular Participation it indicates:

Article 296 - The public assembly is a forum to discuss, in which citizens are invited to exercise their right to information and expression, which aims to inform and answer questions about plans and projects that can affect, directly or indirectly, citizens interests. Article 297 - The debates concerning urban policy are the explanatory reasons, arguments about a particular topic, providing a set and examination may be conducted for clarification not been exhausted at the public hearing.

Article 298 - Public consultation is an consultative level which could take the form of meetings, in which the Public Administration will take decisions based on this set of opinions expressed by the population involved. Article 299 - The call for public hearings on urban issues will be held in advance of fifteen (15) days, through wide dissemination through publication in the Official Journal and at the website of the Municipal Executive Power
8.2 COMMUNITY INVOLVEMENT

The best way of ensuring that communities become safer, stronger, wealthier and more sustainable is by more local involvement in the planning and management of the environment (Wates, 2000). It is by finding ways of developing empowerment and capacities in the local communities that they would be able to take part on the processes.

The importance of participation and community engagement is broadly discussed and quite well known. However, the ways of achieving it are still not explicit. In Fortaleza there is not a clear participation process to be followed on urban development actions, especially for urban infrastructure projects.

How this involvement should be done is an important matter when discussing urban development. It is important to find the way local people can best involve themselves in the complexities of architecture, planning and urban design, and how can professionals best build on the local knowledge and resources. Considering this, a wide range of methods has been developed in different countries. (Wates, 2000)

In Europe several effective methods have been used for the past years. They include new ways of people interacting, new types of event, new types of organisation, new services and new support frameworks. Based on the work of Nick Wates (2000), some of the principles could be used on the elaboration of a community development in Fortaleza.

According to Wates (2000), the benefits of getting people involved are:

1 Additional resources

Governments rarely have sufficient means to solve all the problems in an area. Local people can bring additional resources which are often essential if their needs are to be met and dreams fulfilled.

2 Better decisions

Local people are invariably the best source of knowledge and wisdom about their surroundings. Better decision-making results if this is harnessed.

3 Building community

The process of working together and achieving things together creates a sense of community.

4 Compliance with legislation

Community involvement is often, and increasingly, a statutory requirement.

5 Democratic credibility

Community involvement in planning accords with people’s right to participate in decisions that affect their lives. It is an important part of the trend towards democratisation of all aspects of society.

6 Easier fundraising
Many grant-making organisations prefer, or even require, community involvement to have occurred before handing out financial assistance.

7 Empowerment
Involvement builds local people’s confidence, capabilities, skills and ability to co-operate. This enables them to tackle other challenges, both individually and collectively.

8 More appropriate results
Design solutions are more likely to be in tune with what is needed and wanted. Involvement allows proposals to be tested and refined before adoption, resulting in better use of resources.

9 Professional education
Working closely with local people helps professionals gain a greater insight into the communities they seek to serve. So they work more effectively and produce better results.

10 Responsive environment
The environment can more easily be constantly tuned and refined to cater for people’s changing requirements.

11 Satisfying public demand
People want to be involved in shaping their environment and mostly seem to enjoy it.

12 Speedier development
People gain a better understanding of the options realistically available and are likely to start thinking positively rather than negatively. Time-wasting conflicts can often be avoided.

13 Sustainability
People feel more attached to an environment they have helped create. They will therefore manage and maintain it better, reducing the likelihood of vandalism, neglect and need for costly replacement.

From the European examples it is important to understand the principles embedded on community development, in order to translate them to the Brazilian context. The central idea is the same in both cases, however the levels of implementation are very different. Which means that in the case of Fortaleza it is still necessary to set the environment for an effective community engagement.
8.4 THE PARTICULAR CASE OF THE 1ST RING ROAD

It is an important task to build a large scale and important infrastructure project in the urban fabric as it is a high investment and a structural element of the city. Several actors should be involved and the participation process can be very difficult.

Urban infrastructure projects are generally, as in the particular case of the 1st Ring Road, developed inside the public sector institutions. Either in the municipal or the state level, the project is defined in the infrastructure department, which design a basic project to be published for the bidding. The lowest proposed budget wins the bidding are responsible for the detail project for execution together with the environmental impacts studies and the construction approvals. The project might be presented to councils and chambers, however most of the society gets informed about it when the construction is about to start, or sometimes beforehand when there is a direct impact in the dwellers nearby, which basically means when there will happen evictions.

The story behind such developments in Fortaleza, as previously discussed in this work, tend to follow private interests and benefit the market and some privileged groups. This happens mainly by allowing land speculation and gentrification in high value areas. In such a context it is important to develop more transparent decision making processes and parity in the decision boards to assure effective checks and balances. Even though the legal statements indicates equal representations on the councils and boards, the decisions forums remain largely dominated by the authorities representatives, leaving the urban matters under political control.

The weakest point of the development of large-scale infrastructure lies on the design project itself. The poor consultations on the detail project have been leading to mostly unlikely outcomes. This can be related to a remaining technocratic mind-set embedded in rational exercise of the profession, excluding citizens from the designs and evaluation of the projects. People are not aware of the outcome until the construction is finished. Therefore the social and spatial impacts are not forecasted and the affected population that is not involved in the process cannot intervene. The result, as in the case of the Ring Road, is very unbalanced and the most vulnerable groups endure the higher costs. Another important fact is the lack of a deep analysis of the costs and benefits on the elaboration of the project. Local scale effects and spatial qualities are well not measured, and compensations are not fairly defined.

Within this context and reflecting on the experience of European countries on community involvement it is possible to think of alternative ways. Instruments that incorporated to the current urban development system can provide safeguards and guide the processes towards more social just outcomes.
In order to help providing more socially just outcomes when it comes to large-scale infrastructure projects, the decision making processes must ensure the community involvement. Through a transparent and participative process and also the engagement of non-governmental organizations and popular associations. It is fundamental to provide a system of check and balances, distributing the power of the decision making and allowing a proper accounting practice in the process.

Evaluating and providing proper statements might be a important tool to achieve lesser social-spatial effects. The costs and benefits analysis is very important to measure the real impacts of the implementation of such projects. In addition to that, considering the principles of social justice and what was argued in this work, another tool can be added to complement the Neighbourhood Impact Study (Estudo de Impacto de Vizinhança EIV) present in the Directive Plan of 2009 (PDP 2009). This tool suggested here is a social justice statement, which consists of a evaluation of the social and spatial impacts that the proposed infrastructure project might bring to the affected population.

It is necessary to approximate the elaboration of the design project to the participation process. A important factor encountered in this research is that the population do not have access to the projects until they start being constructed. Therefore, it is crucial to have a transparent and also participative design process. In this way we should be able to forecast better the real social impacts of these projects.

Fig 8.1 Process design diagram
Source: based on literature review
Fig 9.1 View from occupation typologies along the 1st Ring Road - case 02
Source: Author
9 CONCLUSIONS

This thesis starting point was the aim to understand and expose the challenges and opportunities arise from the implementation of large-scale infrastructure projects. It began with the purpose to investigate the decision-making processes of such projects, as well as evaluate the existing regulations in the planning system of Fortaleza. The analyses were developed based on the conceptual framework of social justice, and the principles derived from it guided this whole discussion. From that investigation, it was possible to suggest an alternative approach to the problem for the physical space and to indicate some ideas that might contribute to the discussion around the decision process of this kind of projects.

One of the most important findings of this research is the understanding that the integration between the decision-making processes and the design approaches are very far from each other in the urban development of Fortaleza. It is important to have more connected sectors that respond for the spatial planning and development of the city. The relation of the planning culture, governance structure and the design philosophy in the context of Fortaleza, and many other cities in Brazil and Latin America, are very influential on the conception and implementation of infrastructure projects. Even though there is an increasing awareness and will of intervening in the city in a more socially fair way, those ideas are not being taken forward. The technocratic and engineering mentality remains within the ideas from the past, which does not attend the demands of the reality.

Projects, especially on large-scale infrastructures should be subject for effective public participation. Communities should be able to engage in the process, they should be able to contribute to the solutions of projects that will bring important changes for their living conditions. Therefore the possibility of having deeper social and spatial impact analysis, where the costs and benefits analysis is drawn beforehand the implementation of the project, is crucial in a more transparent and engaging process.

The city of Fortaleza, as described in this work, has been designed by the actions of disconnected political terms in a fragmented governance structure. Those actions have not been able to properly diminish the social inequalities. Thus, it is by the use of the principles of social justice, guiding the process and actions of spatial planning and design, that the society can define values that would not serve only the interests of privileged groups, but instead might help to promote a shift towards the construction of more socially inclusive and spatially just spaces.
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Sampaio, C.F. (2003) Urban Development and Increased Sociospatial Inequalities In Fortaleza, Brazil: The Role Of Planning, Urbana: Graduate College of the University of Illinois at Urbana-Champaign.


**Other relevant publications**


**Data Sources**

ETUFOR - Urban Transport Company of Fortaleza (Empresa de Transporte Urbano de Fortaleza)

IBGE - Brazilian Institute for Geography and Statistics (Instituto Brasileiro de Geografia e Estatística)

PMF - Municipality of Fortaleza (Prefeitura Municipal de Fortaleza)

Arquivo Nirez - Ceará private historical photographic collection

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LIST OF MAPS

Map 1.1 Fortaleza in South America context. 10
Map 3.1 Urban growth before 1875 36
Map 3.2 Urban growth 1875 - 1959 36
Map 3.3 Urban growth 1959 - 1978 36
Map 3.4 Urban growth 1978 - 1995 37
Map 3.5 Urban growth 1995 - 2005 37
Map 3.6 Road system and income per district 38
Map 3.7 Jobs supply and services locations 39
Map 3.8 Density and public transport 40
Map 3.9 Poverty and informal settlements 41
Map 4.1 Map of the Special Zones of Social Interest 61
Map 5.1 1st Ring Road and road network 66
Map 5.2 Bus and rail network with light rail project 74
Map 6.1 Area defined for the analysis - built part of the 1st Ring Road 80
Map 6.2 Income spatial distribution by district 82
Map 6.3 Population Density by census tract 82
Map 6.4 Building Typologies 85
Map 6.5 Jobs supply and services distribution 86
Map 6.6 Housing relocations 86
Map 6.7 Housing Displacements 87
Map 6.8 Road Permeability 89
Map 6.9 Road Structure 91
Map 6.10 Open and public spaces 95
Map 6.11 Recreational spaces 97
Map 7.1 Informal settlements and urban voids 105
Map 7.2 Potential for public spaces 107
Map 7.3 Permeability potential 109
Map 7.4 Public transport potential 111
Map 7.5 Economic development potential 113
Map 7.6 Strategic Potentials 115
Map 7.8 Open and public areas - case 01 118
Map 7.7 Open and recreational spaces - case 01 118
Map 7.9 Formal and informal settlements - case 01 118
Map 7.10 Displaced Houses and New Buildings - case 01 120
Map 7.12 Directive Plan Zoning - case 01 120
Map 7.11 Pedestrian accessibility - case 01 120
LIST OF FIGURES

Fig. 1.1 Daily commute in Fortaleza by motorized transport 12
Fig. 1.2 Daily commute in Fortaleza 12
Fig. 1.3 Social groups dynamics 12
Fig. 1.4 Informal settlement along the train tracks - community Trilha do Senhor 15
Fig. 1.5 View of Campo do América informal settlement 16
Fig. 1.6 Thesis structure diagram 18
Fig. 2.1 View of the informal settlements along the train tracks, Parangaba district. 20
Fig. 3.1 Fortaleza in the 90s 30
Fig. 3.2 Fortaleza 1956 35
Fig. 3.3 Plan of the Village of Fortaleza 1730 36
Fig. 3.4 Ceará tramway 1880 36
Fig. 3.5 Beach Promenade (Beira-Mar) 1960s 36
Fig. 3.6 Beach Promenade (Beira-Mar) 1980s 37
Fig. 3.7 Verticalization process 2000s 37
Fig. 3.8 Urban development governance structure 45
Fig. 3.9 Topographical plan of the city by Adolpho Hebster in 1875 46
Fig. 3.10 Plan of 1811 49
Fig. 3.11 Plan of 1730 49
Fig. 3.12 Fortaleza urban planning timeline 51
Fig. 3.13 Zoning map of the Participatory Directive Plan of 2009 53
Fig. 4.1 Houses being demolished for the light rail implementation 54
Fig. 5.1 View from a house on the 1st Ring Road 64
Fig. 5.2 View of the train tracks and informal settlements by the 1st Ring Road 69
Fig. 5.3 View of high-rise buildings on the 1st Ring Road 69
Fig. 5.4 1st Ring Road timeline 71
Fig. 5.5 View from the under construction tracks of the light rail 72
Fig. 5.6 The old Parangaba rail station 76
Fig. 5.7 Sign with the project model 78
Fig. 5.8 View of Light rail construction 78
Fig 6.1 View of different typologies along the road 84
Fig. 6.2 Cyclist crossing the light rail tracks 88
Fig. 6.3 1st Ring Road intersections 90
Fig. 6.4 Road Sections 93
Fig. 6.5 Kids playing in improvised football field at Comunidade Alto da Paz 94
Fig. 6.6 Beira Mar - beach promenade 96
Fig. 6.7 Cocó River Ecological Park 96
Fig. 7.1 View of informal houses along the train line 102
Fig. 7.2 Location case 01 116
Fig 7.3 Case 01 118
Fig 7.4 Case 01 3D view 119
Fig. 7.5 View of the light rail tracks 121
Fig. 7.6 View of the road profile 121
Fig. 7.7 View of rail tracks and informal settlements 122
Fig. 7.8 View of the 1st Ring Road profile 122
Fig. 7.9 Case 01 - 200x200m test location 123
Fig. 7.10 Plan of existing situation - case 01 124
Fig. 7.11 Section of condition before the construction of the 1st Ring Road - case 01 124
Fig. 7.12 Section existing situation - case 01 124
Fig. 7.13 Road profile and rail tracks - case 01 125
Fig. 7.14 Plan of light rail proposal - case 01 126
Fig. 7.15 Section of light rail proposal - case 01 126
Fig. 7.16 Light rail station project 3D model 127
Fig. 7.17 Alternative proposal plan 1st phase - case 01 128
Fig. 7.18 Section of alternative proposal 1st phase - case 01 128
Fig. 7.19 Visualization of alternative proposal 1st phase - case 01 129
Fig. 7.20 Alternative proposal plan 2nd phase - case 01 130
Fig. 7.21 Section of alternative proposal 2nd phase - case 01 130
Fig. 7.21 Visualization of alternative proposal 2nd phase - case 01 131
Fig. 7.22 Public squares - case 01 132
Fig. 7.19 Bike lanes and sidewalks - case 01 132
Fig 7.20 Urban furniture - case 01 132
Fig 7.21 Intersection - case 01 133
Fig. 7.23 Urban furniture - case 01 133
Fig. 7.24 Comparative evaluation of the spatial changes in the use of space - case 01 134
LIST OF TABLES

Table 2.1 Principles for a just city 27
Table 2.2 The Potential of Infrastructure 29
Table 4.1 From theory to spatial analysis 62
Table 6.1 From principles to actions - defining the strategy 100
Table 7.1 Evaluation - case 01 135
Table 7.2 Evaluation - case 02 149