

Illus. 8: The Maputo Baixa in focus - aerial view (C Deacon)



Chapter 3: Regional Urban Character

"Our everyday life-world consists of concrete 'phenomena'. It consists of people, of animals, of flowers, trees, and forests, of stone, earth, wood and water, of towns, streets and houses, doors, windows and furniture. And it consists of sun, moon and stars, of drifting clouds, of night and day and changing seasons. But it also comprises more intangible phenomena such as feelings. This is what is 'given', this is the context of our existence."

(Norberg-Schulz, 1979: 6)

This chapter deals with an introduction to the 'given' context of the Maputo Baixa, without providing any specific analyses and immediate urban framework, since this will be dealt with in following chapters. It seeks to define the context to which an intervention relates.

An overview of the regional character defines the context to which new fabric relates. It serves to identify the potential of the area outlining the needs, and suggesting an appropriate program.

The existing scale, massing, and spatial character of the area can be used as a contextual guide for devising a new built fabric. The available palette of architectural materials also contributes to the character of the proposed intervention and the place.

Context Identity

Climate

Understanding the climate of a region is important architecturally since "...the more we know about the dynamics and subtleties of climate ... the more we understand about the nature of the appropriate architectural response" (Brown and Novitski, 1981: 299). Knowledge of the climate in Maputo is therefore essential.

As shown on the climatic maps below, Maputo has an annual mean rainfall of 600 to 800mm which falls mainly during the summer months. The area has an average temperature of approximately 23 °C, but this temperature can reach a mid-day maximum temperature in the high 30s and low 40s during summer, and with the high coastal humidity levels it can become uncomfortably warm. The maps below consequently describe Maputo as having a 'Tropical-humid' climate (s.a.).

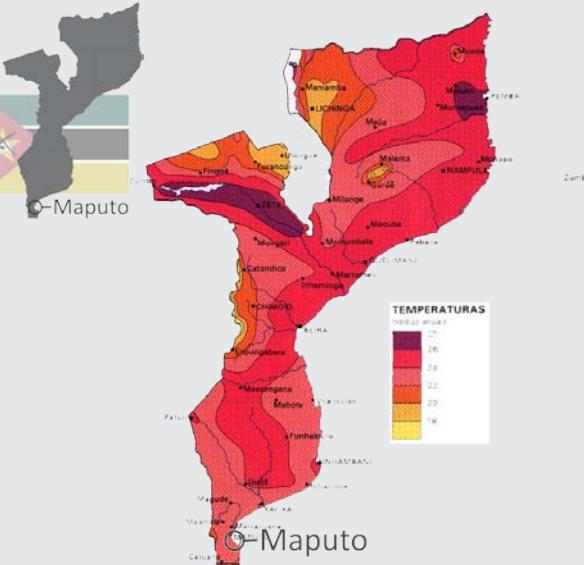


Fig. 1: Average Annual Temperature

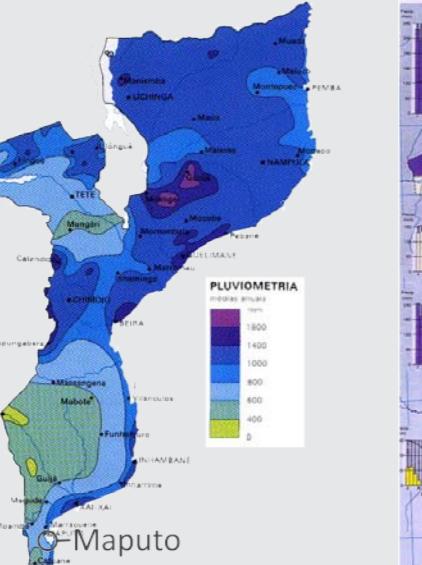


Fig. 2: Annual Rainfall

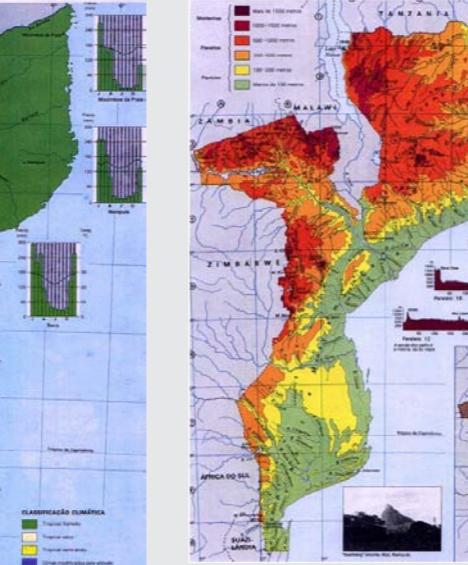


Fig. 3: Climatic Zone

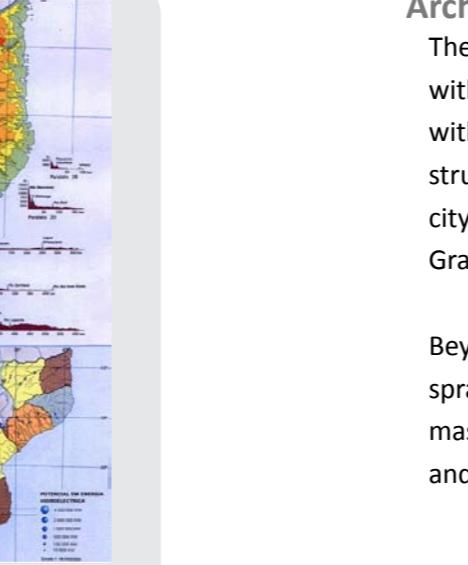


Fig. 4: Altitude

The proximity of the Maputo Baixa to the sea will result in accelerated corrosion of unprotected steel, copper, and other metals; glass will also need to be cleaned very often due to the accumulation of sea-spray even on buildings several blocks from the water's edge. The moderating effect of the ocean will create an environment in which relatively little daily temperature variation occurs; consequently architecture in the area has little reason to close itself against cold weather.

The hot humid climate of Maputo has the following desirable architectural implications (Holm and Viljoen, 1996: 30):

1. Large ventilation openings on the North and South.
2. Ventilated roof space with low thermally conductive roof.
3. No windows on East and West due to solar gain.
4. Lightweight wall construction, walls need not be insulated if they are completely shaded.
5. Shading of walls and openings (deep verandas/broad eaves)
6. Narrow free-standing buildings for efficient natural ventilation.
7. Creation of shaded open spaces.

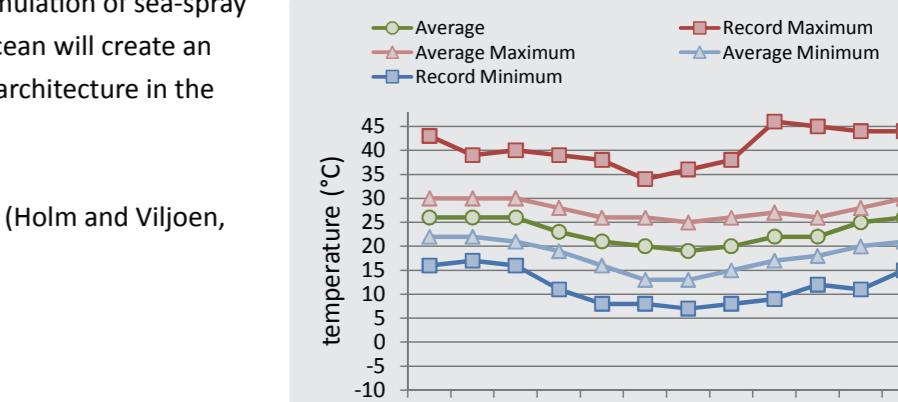


Fig. 5: Maputo: average temperature by month
(author: BBC Weather)

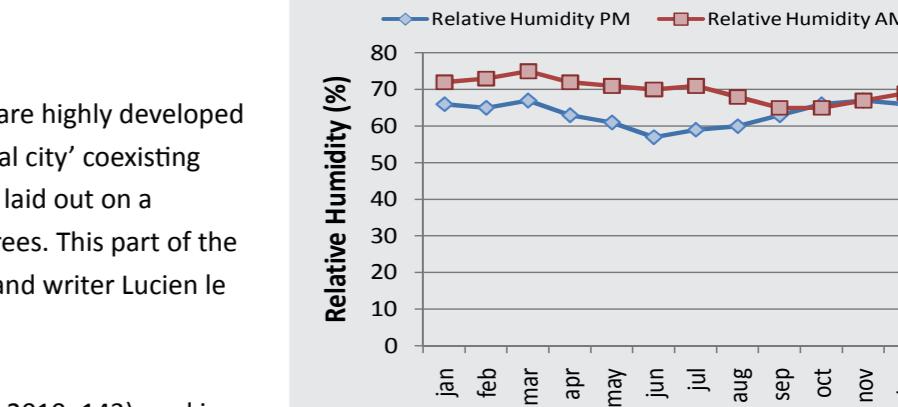


Fig. 6: Maputo: Relative Humidity by month
(author: BBC Weather)

Architectural Character

The city of Maputo is in many ways a typical African city, while certain areas of the city are highly developed with all the amenities and services of the average western city, there is also the 'informal city' coexisting with the formal city (Folkers, 2010: 143). In Maputo there is the modern 'concrete city', laid out on a structured grid of paved streets, serviced with electricity and water, and planted with trees. This part of the city is generally -but not exclusively, the old colonial city. This is, according to architect and writer Lucien le Grange, characterized by imported "...Victorian and Art-Deco Styles..." (2009: 10).

Beyond the formal city grid where the tarred roads end, the 'other city' begins (Folkers, 2010: 143), and is a sprawling mass of poorly serviced informal buildings – sometimes laid out to a formal pattern. This informal mass of mostly self built houses, constructed using locally available materials such as reeds, corrugated iron, and concrete blocks is perhaps typical of "... eighty percent of the buildings in Africa..." (*ibid.*: 148)



Statutory Declared Heritage Buildings in the Baixa:

1. Mercado Central de Maputo
2. CFM - Train Station
3. Monomento da 1a Guerra Mundial (WWI Monument)
4. Casa dos Azulejos (Tile Building)
5. Standard Bank
6. Fortaleza Nossa Senhora Da Conceição
7. Imprensa Nacional (National Printing Press)
8. Biblioteca Nacional (National library)
9. Tribunal Supremo (Supreme Court)
10. Monumento e estatua de Samora Machel (Samora Machel Monument)
11. Casa de Ferro (Iron House)
12. Centro Cultural Franco Mocambicano
13. Conselho Municipal
14. Se Catedral
15. Radio de Mocambique
16. Telecomunicacoes de Mocambique

All buildings in the heritage zone and any building built before 1920 are also protected.

Built heritage

The Maputo Baixa is the historical centre of the city, with the majority of the built stock between about 1880 and 1975. Other layers built during the construction booms of the 1930s and 1960s are also evident. It was however in the 1960s when, a "...mature modernism emerged..." (Le Grange, 2009: 10), characterized by the use of modern re-enforced concrete and plastered walls. This is perhaps more pronounced in Maputo than in any other southern African city, due to the relative isolation and lack of investment in building during the recent wars in that country, and also the influence of Portuguese architects who sometimes viewed Mozambique as a testing ground for new ideas.

A new layer has also been added following renewed investment in the country after the signing of the peace accord in 1992. Currently, there is, a "...post-modern condition prevailing in Maputo," (*ibid*: 10) and in the Baixa these buildings often contrast starkly with the historic fabric in terms of scale, and the use of contemporary cladding materials such as glass.

The buildings shown in illustration 9, along with any building within the protected zone shown in illustration 10, and any other building older than 120 years old, are protected by Mozambican law as part of the heritage of the country. This makes the Baixa a centre of built historic heritage. However, there are also significant Modernist buildings in this area that are not formally considered part of the heritage of the area. These include the Mosque in Rua do Mosquita, and Modernist buildings like the "BIM building" by architect Joao José Tinoco, (discussed in Chapter Six) as well as many buildings by renowned Mozambican Architects Pancho Guedes and Craveiro Lopes.

Current Layering

What seems to have happened in the years of civil war is the increased dominance of the 'other city'. The Baixa, in the centre of Maputo, seems to have an impromptu, informal layer of concrete blocks, corrugated iron, and reed screening that has been added as users adapt and appropriate spaces. This informal layer is a significant part of the character of the Baixa, contrasting and softening the industrial nature of many of the larger buildings.

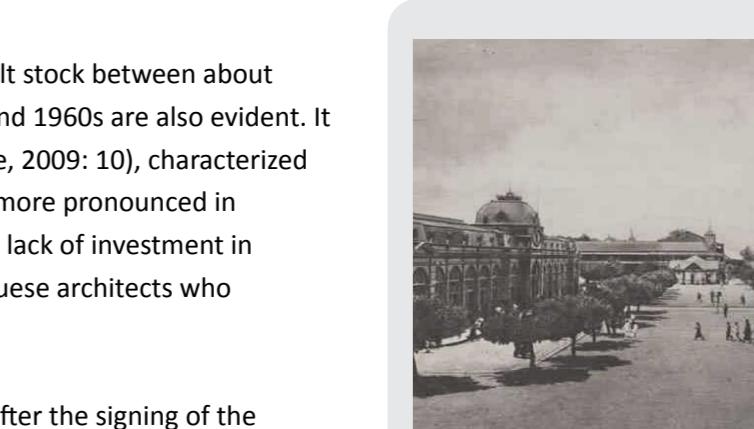
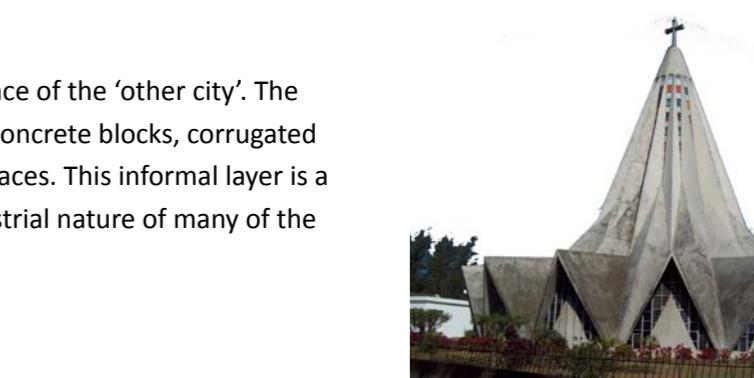


Fig. 7: Maputo: Relative Humidity by month
(author: BBC Weather)



Illus. 10: Building by Pancho Guedes, opposite train station
(author)

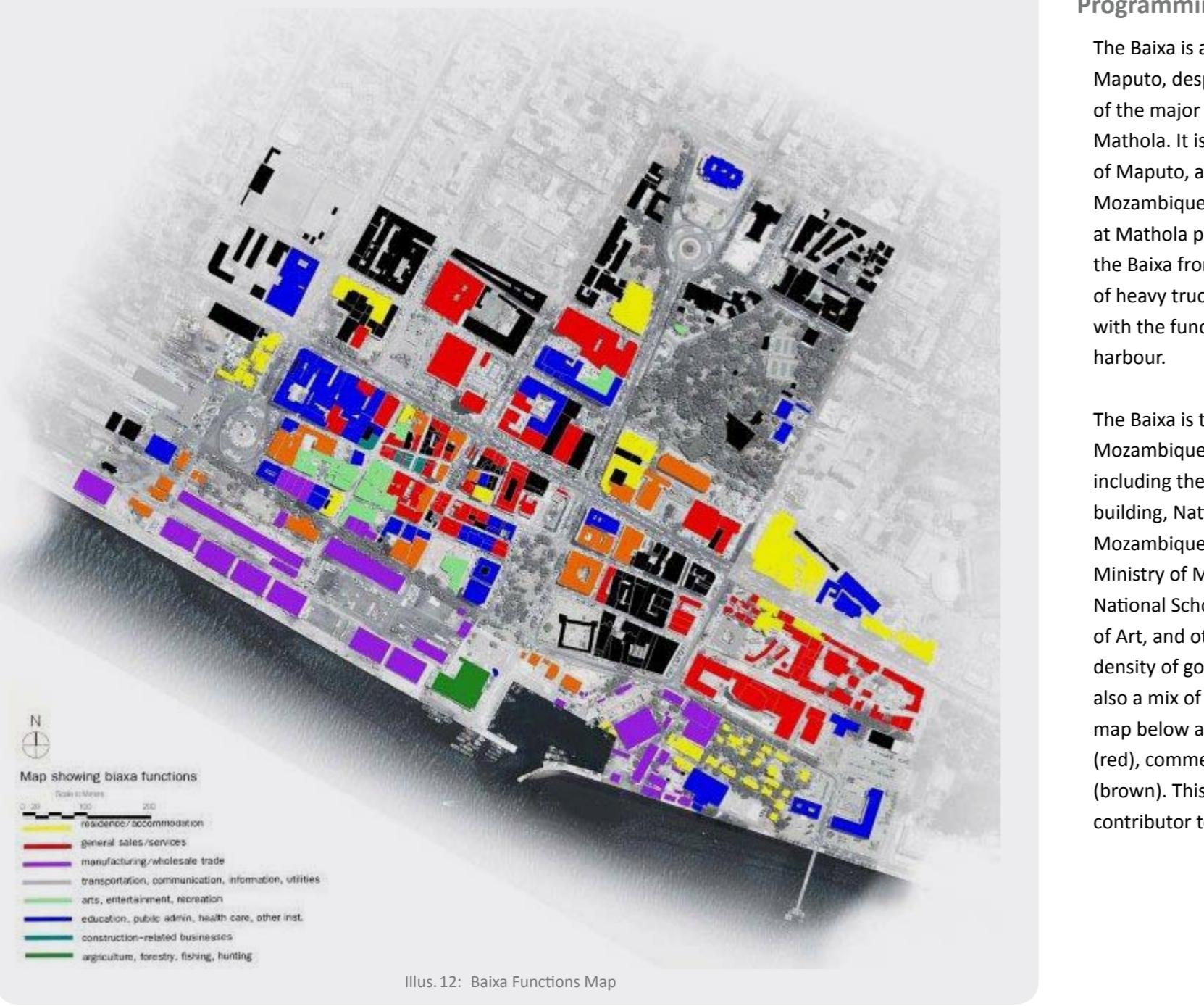


Illus. 11: Church building by Craveiro Lopes (author)

Programming

The Baixa is an important part of Maputo, despite the recent relocation of the major harbour facilities to nearby Mathola. It is still the commercial centre of Maputo, and consequently of Southern Mozambique. This new centre of industry at Mathola protects the historic fabric of the Baixa from damage by high volumes of heavy trucks and machinery associated with the functioning of an industrial harbour.

The Baixa is the seat of many of Mozambique's government departments, including the Prime Minister's Cabinet building, National library, Bank of Mozambique, Mozambican Navy, Ministry of Minerals and Resources, National School of Dance, National School of Art, and others. Despite this high density of government buildings there is also a mix of functions, indicated on the map below as residential (yellow), public (red), commercial (blue), and industrial (brown). This mixed use programming is a contributor to the vitality of the area.



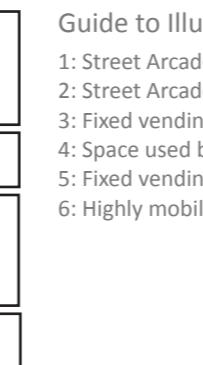
Industrial Heritage

The history of the Baixa is indivisibly linked to industry. This as well as industrial advances often triggered development throughout the history of the Baixa. Including the initial trading of mass-produced cloth and beads by the first European settlers for raw materials and ivory, the creation of a railway link to Pretoria, and the use of pre-manufactured building elements (such as cast iron verandas and columns) in buildings throughout the Baixa. The historical and current relation to the non-bulk section of the harbour also reinforces this industrial link. This historic relation to industrial developments in architecture makes it appropriate that an architectural intervention in this area acknowledges this industrial heritage.

Scale, Massing, Spatial character

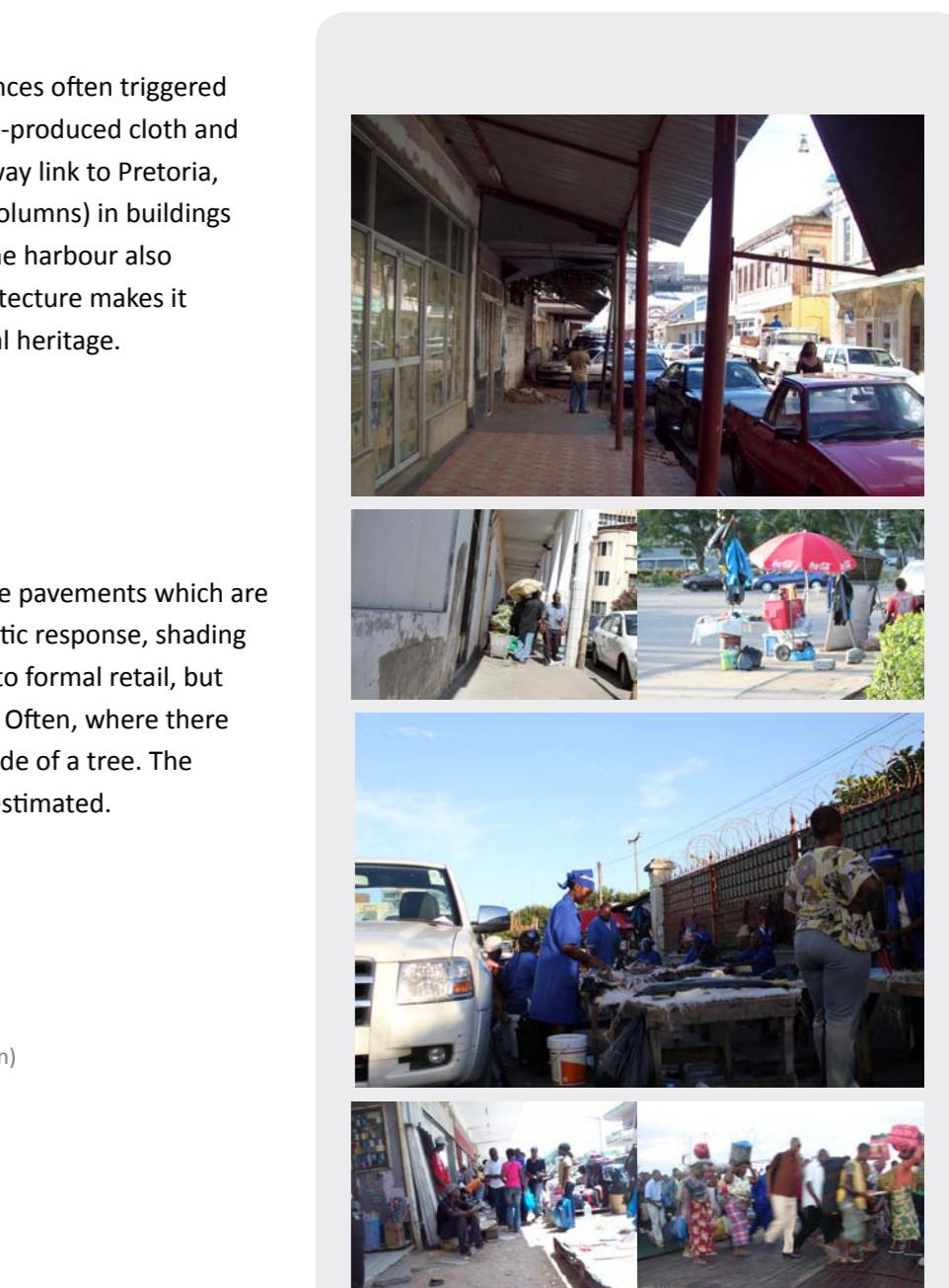
Spatial Character: Importance of the Pavement and Shade

The informal character of the place means that often trade occurs in the street, on the pavements which are often arcaded on the street level. In tropical Maputo, the arcading is primarily a climatic response, shading the glazed fronts of many of the shops. The importance of shade is not only relevant to formal retail, but also to informal retail, and shaded spaces are often congested with informal vendors. Often, where there is no built shading, trade areas are defined by large umbrellas, or nestled into the shade of a tree. The importance of shade, and shelter to informal vending should therefore not be underestimated.



Guide to Illustration - Contextual Character:

- 1: Street Arcade, shopfront & cars define horizontal space (author)
- 2: Street Arcade. (J Casson)
- 3: Fixed vending area defined by umbrella shade (J Casson)
- 4: Space used by Fixed Vendors defined by wall behind and cars at the front (J Casson)
- 5: Fixed vending in Arcade space (author)
- 6: Highly mobile character of space (C Deacon)



Illus. 13: Contextual Character



Illus. 14: Street Scale (top - author, bottom - J Casson)

Spatial Character: Linearity and the Arcade

The ‘transport triangle’ created by the locations of the three main modes of public transport (road, rail, and water) on the outskirts of the ‘old Baixa’, has created a situation where there large numbers of people move between transport terminals. This movement of people has resulted in what is often a linear use of space along a street; the street edge is often arcaded, providing a shaded and sheltered route along which pedestrians move. Architectural theorists Christopher Alexander, Sara Ishikawa, and Murray Silverstein state that arcades are “...partly inside, partly outside...” spaces (A Pattern Language: Towns, Buildings, Construction, 1977: 581). They view the arcade as an introductory ‘ambiguous’ space between the public and private realms, and recommend that these spaces be regarded as places of transition. In the Maputo Baixa, the arcade is used as a place in its own right. Often edged on one side by formal shops, and by informal trade and/or vehicles on the other; the arcade becomes a linear shaded market space. New built fabric needs to consider this linearity, the continuity – or termination thereof, as well as the increased importance and load on these spaces due to informal trade.



Illus. 15: Maputo Baixa Panorama (author from images C Deacon)

Massing

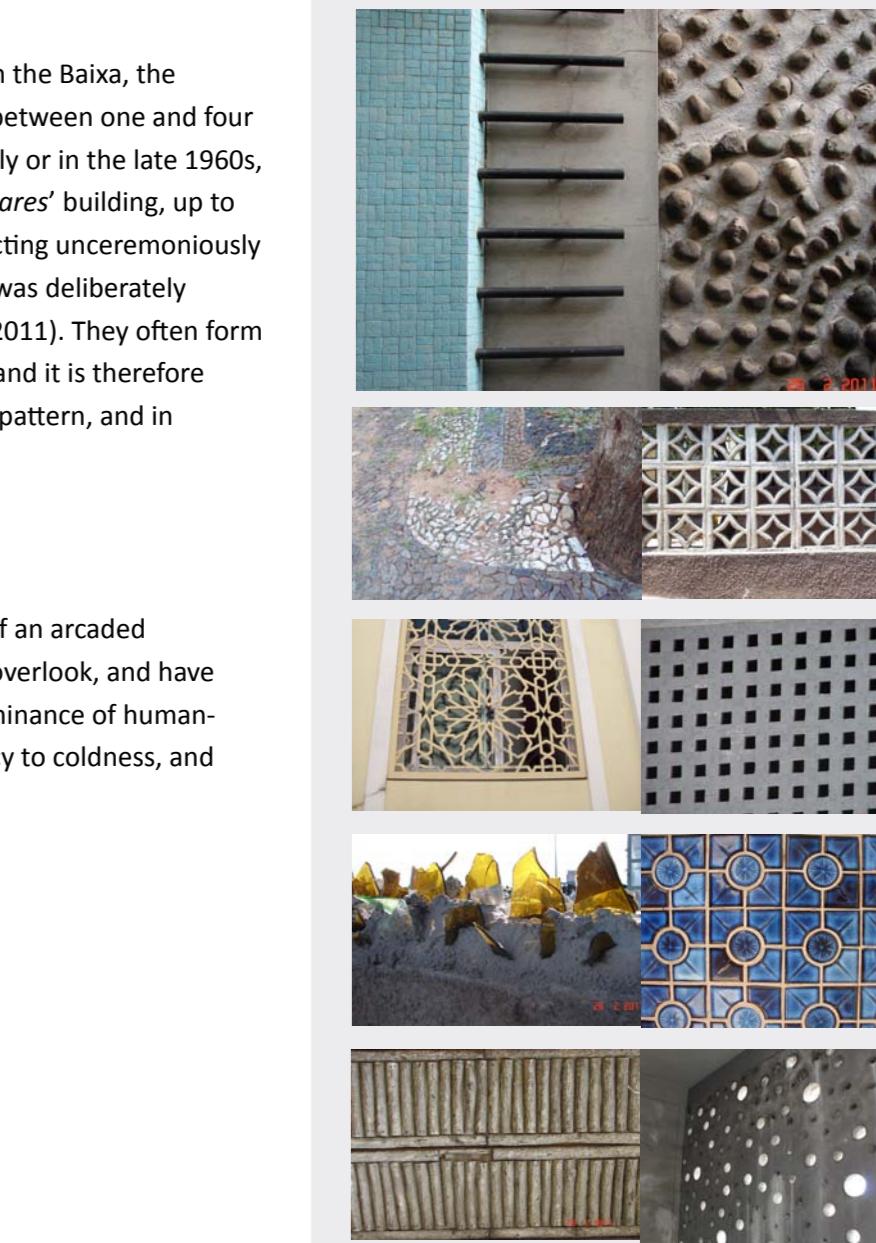
Alexander et al. (*ibid.*:114) recommend a four storey limit to the height of buildings. In the Baixa, the majority of the historic fabric unknowingly conforms to this recommendation, and is between one and four storeys high, limited by predominantly load-bearing technology. Buildings built recently or in the late 1960s, are sometimes eight or ten storeys high, and in the case of the ‘M Cell/trinta-três-andares’ building, up to 33 storeys high. These tall buildings are however, the exception, sometimes projecting unceremoniously from a low plateau of historic buildings. It is said that this spreading of tall buildings was deliberately planned as part of Portuguese regulations before the civil war (Maputo Studio, Sept. 2011). They often form significant named landmarks, a significant part of the intangible heritage of the area, and it is therefore proposed that majority of new fabric should not exceed this limit in keeping with this pattern, and in accordance to local heritage.

Scale

The general maximum height of four storeys, in conjunction with the predominance of an arcaded building interface creates an environment where the occupants of the top floors still overlook, and have a connection to the street (*ibid.*:118) and relate to the pedestrian through the predominance of human-scale arcading. Buildings in this area that do not fit this general pattern, risk a tendency to coldness, and detachment from the street, and should be avoided.

Guide to Illustration - Contextual Materiality:

- | | |
|---|---|
| 1 | |
| 2 | 3 |
| 4 | 5 |
| 6 | 7 |
| 8 | 9 |
- 1: Built texture contrast, Pancho Guedes. (C Deacon)
 - 2: Cobble pavements texture (author)
 - 3: Grelhas grill block texture (author)
 - 4: Islamic patterned steel burglar guard (author)
 - 5: Grelhas grill block texture (C Deacon)
 - 6: Burglar-proof coping on concrete block wall (C Deacon)
 - 7: Ceramic texture (C Deacon)
 - 8: Lath window shutter (C Deacon)
 - 9: Cast interpretation of the grill-block principle. Pancho Guedes (J Casson)



Illus. 16: Contextual Materiality

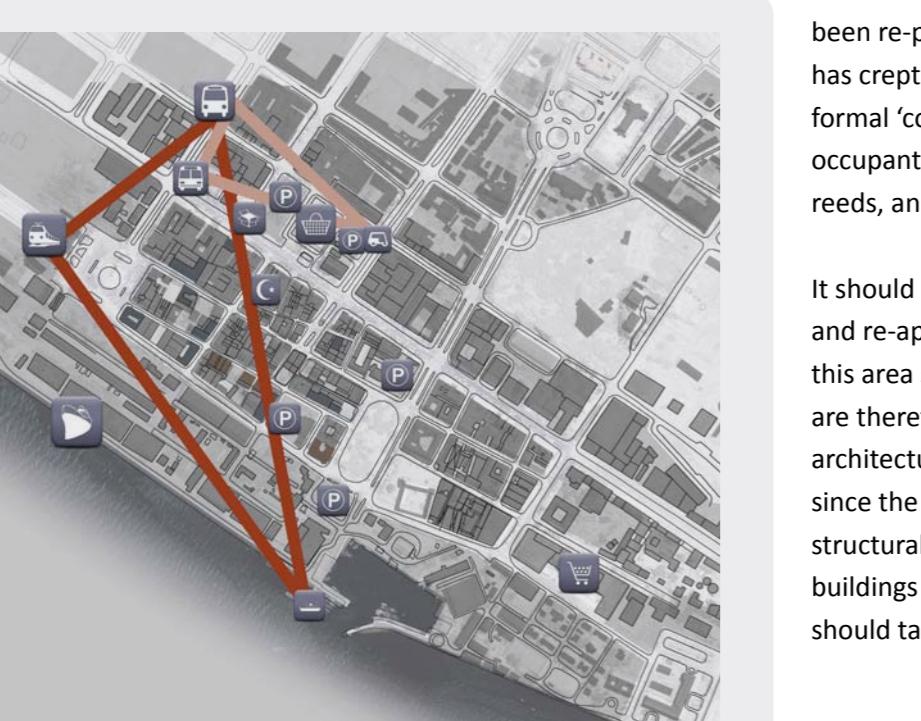


Illus. 17: The Patina of time (C Deacon, author, C Deacon)

Contextual Materiality

Existing Materiality

The existing buildings in the Baixa built according to western tradition since about 1880 using solid and sometimes cutting-edge formal materials. This puts the Baixa firmly into the 'concrete city' alluded to by Folkers in *The Contemporary African City* (2010: 143). A multitude of architectural influences are apparent in the building finishes and textures, ranging from prefabricated European colonial cast-iron verandas, and ornate Islamic patterned steel burglar guards, to fine texture Portuguese pavement cobbling and the African inspired textures of the Mozambican architect Pancho Guedes.



Illus. 18: Transport triangles, creating pedestrian movement past the market (author)

Material Availability

The availability of materials has a large influence on the character of the contextual built fabric. The fact that the Baixa is adjacent to a harbour means that international goods are readily available. Materials that are produced locally at a low-cost, do however still have a significant influence on the built fabric. The table below shows the most important of these materials.



Illus. 19: Stripped Lead-wood poles (author)



Illus. 20: Mozambican clay bricks (author), Stripped poles and reeds (author)



Illus. 21: Mopane poles (author), Eucalyptus timber (author), Reeds (author)

Material	Description	Produced	Sourced	Sizes (mm)	Comments
Timber – Eucalyptus (<i>Eucalyptus</i> species)	Fairly consistent hardwood including some cants & knots	Informal sawmills Xiquelene, Maputo	Salamanga, southern Mozambique	2400, 1300 lengths	Not kiln dried. Exotic species
Timber – Pine (<i>Pinus</i> species)	Fairly consistent softwood	Informal sawmills Xiquelene, Maputo	Malawi	4900, 5500 to 6000 lengths	Not kiln dried. Exotic species
Timber – Chanfuta (Regional Mahogany species: <i>Afzelia quanzensis</i> & <i>Khaya anthotheca</i>)	High quality hardwood, no defects, termite and borer resistant	Informal sawmills Xiquelene, Maputo	Inhambane province, Mozambique	2300, 1550 lengths	Not kiln dried. Indigenous species. (<i>Khaya anthotheca</i> IUCN Redlist: Vulnerable) (<i>Afzelia quanzensis</i> Protected in South Africa)
Timber – Mopani Poles (<i>Colophospermum mopane</i>)	Raw Mopani poles	Informal pole merchants Xiquelene, Maputo	Mongweni, Mozambique	±4500	Indigenous species.
Timber – Eucalyptus Poles (<i>Eucalyptus</i> species)	Raw hardwood poles	Informal pole merchants Xiquelene, Maputo	Salamanga, southern Mozambique	±4500	Exotic Species
Timber – Lead-wood Poles (<i>Combretum imberbe</i>)	Stripped Lead-wood (Simbiri/iNtimbi) poles	Informal pole merchants Xiquelene, Maputo	Inhambane province, Mozambique	±4500	A protected species in South Africa. Very hard timber.
Reeds	River reeds	Xiquelene, Maputo		±4500	Seen as a sub-economic material
Clay “ceramic” Bricks	Large extruded clay bricks	Maputo surrounds	Maputo Province	Length: 300 Height: 200 Width: 70/100/150/200	Strength: 1,5MPa & 2,5MPa. (4MPa special order)
Concrete Block / Bloco	interlocking concrete block	Around Maputo	Concrete: Mozambique	Length: 400 Height: 200 Width: 70/100/150/200	Used widely throughout Maputo
Grill Block / Grelhas	Concrete grill block	Around Maputo	Concrete: Mozambique	Various	Used widely throughout Maputo

Table 1: Materials Locally unique to Maputo / Mozambique

Threats

The Baixa being situated just above sea-level on reclaimed marshland is vulnerable to flooding. This currently occurs due to rainfall flooding, but is according to the Mozambican Institute for Disaster Management sea-rise flooding during cyclonic events is an increasing risk. (Study on the Impact of Climate Change on Disaster Risk in Mozambique: Synthesis Report, 2009: 12)

Rainfall Flooding

Rainfall flooding in the Baixa is exacerbated by its situation within a crescent shaped escarpment. This escarpment acts as a large catchment area, gathering rainfall on the hard urban surfaces, and concentrating it into the low-lying Baixa, this excess run-off does not drain fast enough into the ocean to prevent flooding, due to the low flat nature of the Baixa.

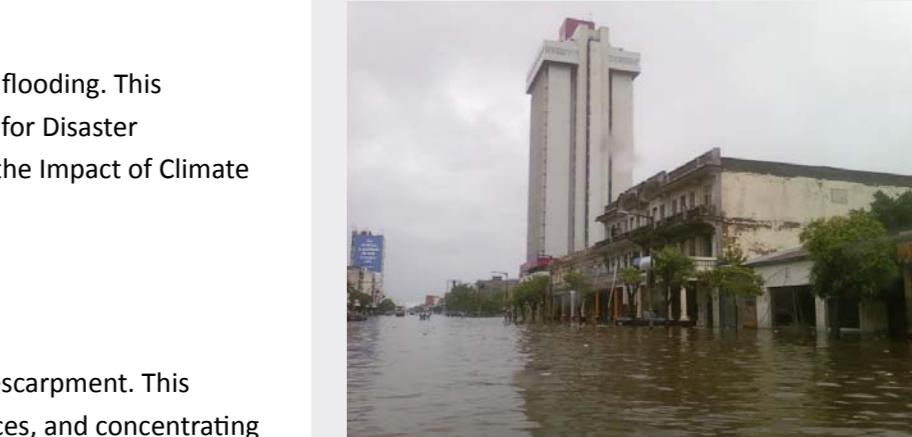
The drainage of this area is poor due to its proximity to sea-level, and the cupping within the reclaimed area. Refuse blocking of the few drains and inadequate regularity of storm water inlets also exacerbate the situation.

Sea-level Rise Flooding

The country of Mozambique is prone to cyclones, which batter the coastline occasionally, and cause flooding due to storm surges into low-lying areas. This coupled with the predicted increase in cyclonic activity means that sea flooding of the Baixa will occur more regularly than it has in the past (Republic of Mozambique National Institute for Disaster Management (INGC), 2009: 10 - 12)

Scenario	2030	2060	2100
Low Sea Level Rise Scenario –‘best case’	100mm	200mm	300mm
High Sea Level Rise Scenario –‘worst case’	100mm	1 000mm	5 000mm

Table 2: Sea Level Rise Scenarios (Republic of Mozambique National Institute for Disaster Management (INGC), 2009)



Illus. 22: Baixa Flooding - Ave 25 Setembro looking west



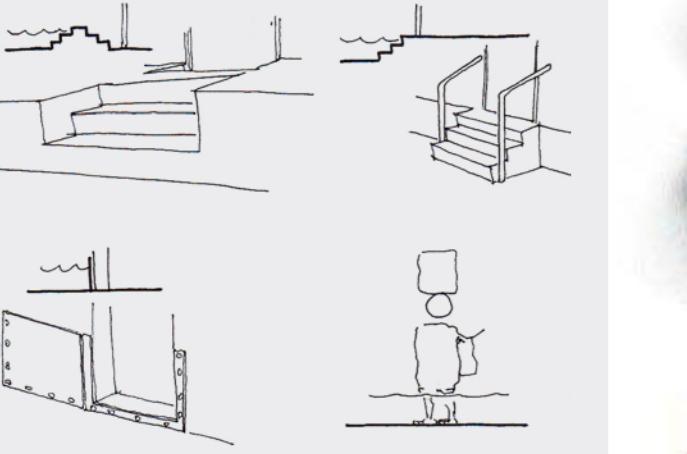
Illus. 23: Baixa Flooding - cnr. Ave 25 Setembro & Karl Marx



Illus. 24: Baixa Flooding - cnr. Ave 25 Setembro & Karl Marx

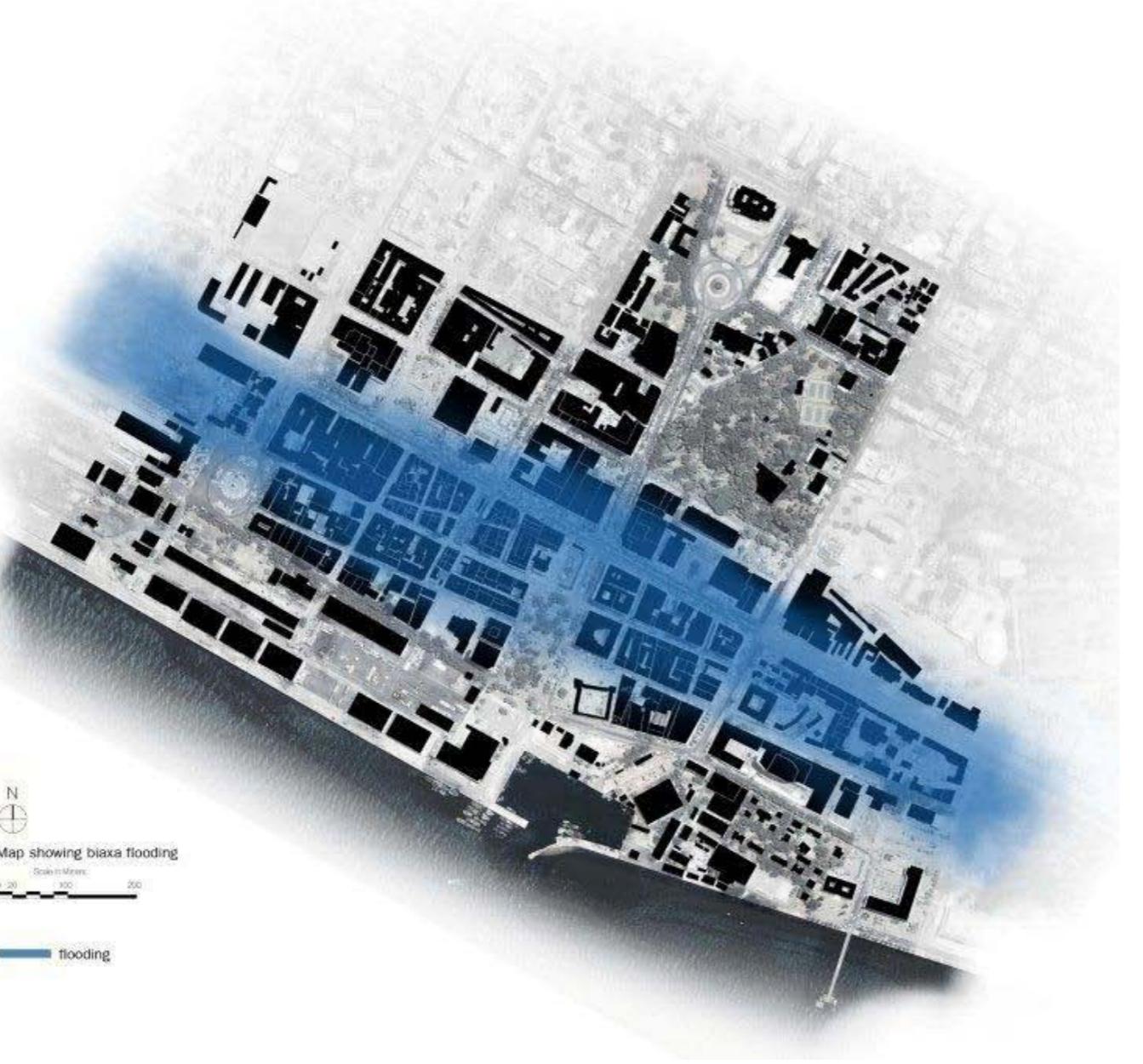


Illus. 25: Baixa Flooding - Municipal Market



Illus. 27: Baixa Flooding: Various methods currently used by occupants to deal with flooding (author)

Flooding map



Illus. 26: Baixa Flooding Map

Existing Response to Flooding

Existing buildings in the Baixa, while not having any basements, respond to this periodic flooding in one of four ways:

- 1) A step barrier, stairs at the entrance of the building, going up to approximately a meter in height, then immediately down again to a low internal floor level.
- 2) A steel gate, made from a plate of steel approximately a meter high, which swings across a doorway, and bolts tightly onto a neoprene foam seal.
- 3) A plinth, raised over a meter above street level, used by mainly by banks with electronic equipment on the ground floor.
- 4) Resignation and acceptance to the fact that it does flood, but that the flooding is short lived, with economic impact.

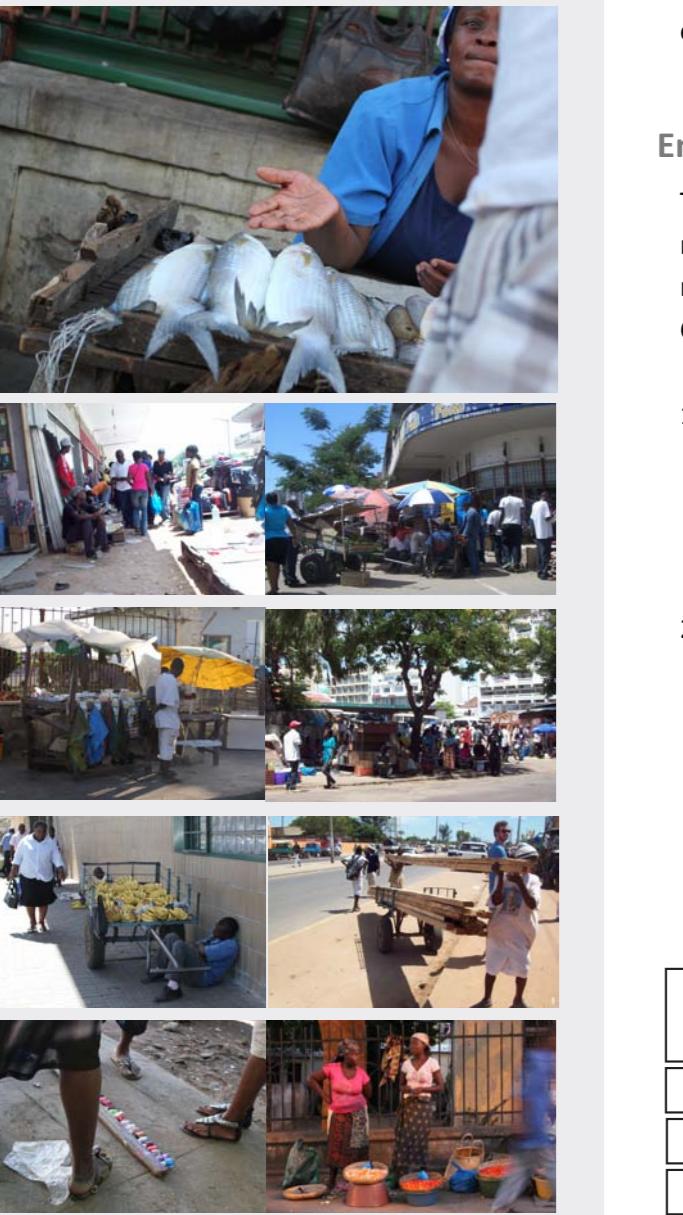
Considering the predicted increased incidence of flooding, it is essential that new developments have a strategy to cope with this.

Potential & Needs

Transport Importance

Maputo is an important city in terms of transport. Positioned as the end point on the Maputo – Johannesburg transport corridor, it is important to terrestrially based transport, as well as being a point of interchange between aerial, oceanic, and terrestrial transport. The city forms a gateway to the country, with many travellers and tourists stopping in Maputo before moving north.

The Baixa is the heart of the transport system in Maputo; it therefore has national and international transport importance. Buses, trains, and *chappas* (mini-bus taxis), operate from here on international, national, and local levels; while ferries serve to bridge the barrier created by the Maputo Bay, and link costal- and island- destinations to the city centre. Small three wheeled *tuk-tuks* move passengers short distances. The major train, ferry, *chappa*, and bus terminals are located within five minutes walking distance (400 meters) of one-another, triangularly arranged around the Baixa. The resultant pedestrian traffic



Illus. 28: Contextual Character

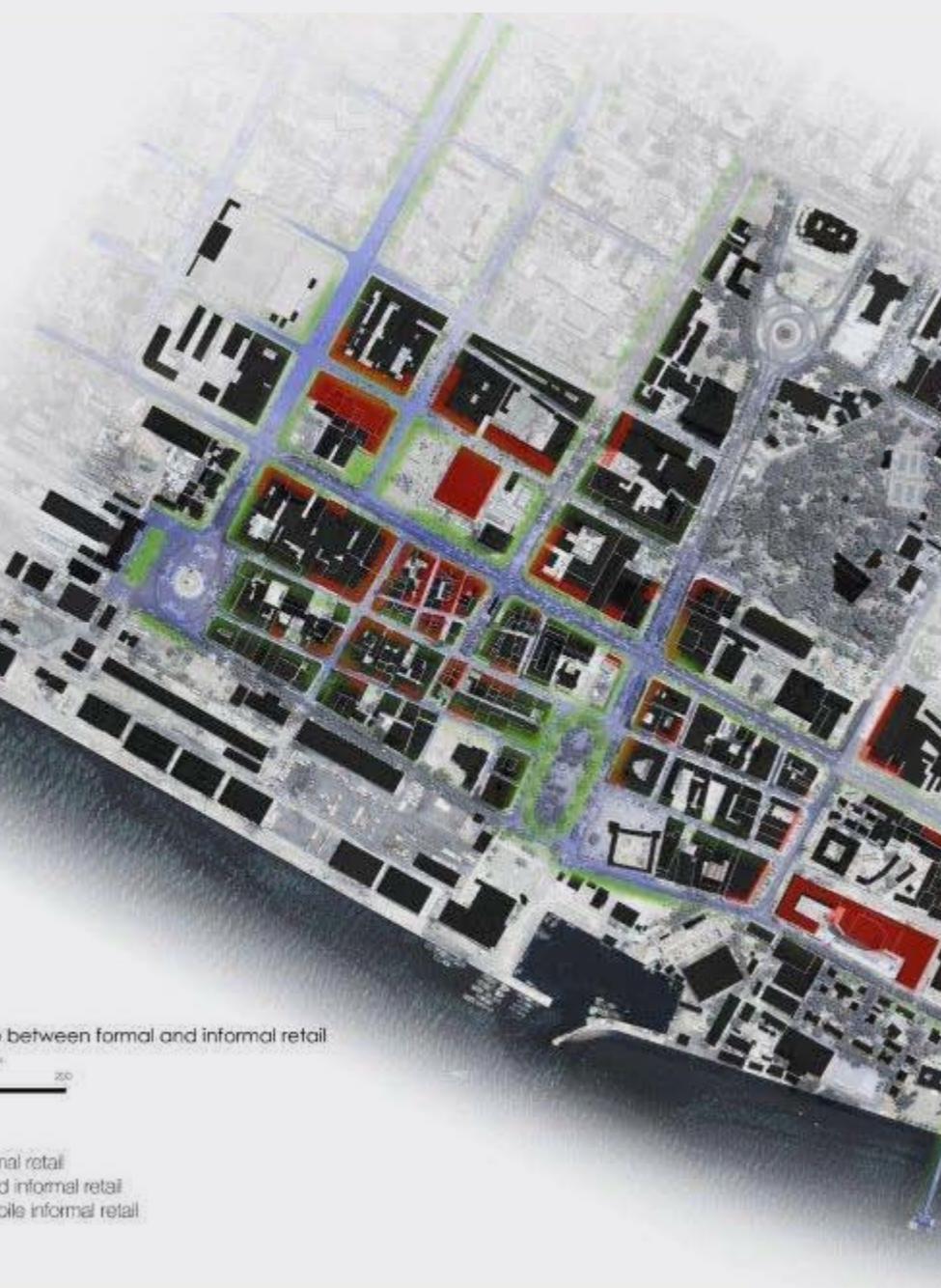
between these points contributes positively to the character of the area. This creates potential for enterprise, a fact that has not been missed by entrepreneurial Mozambicans and a cosmopolitan array of businessmen and shopkeepers.

Enterprise

The transport related traffic and port function of the Baixa lends itself to retail. Medium 'formal' and micro 'informal' retail coexist side-by-side, with formal retailers often using informal vendors as a manner of reaching customers before their competition. A more detailed analysis of retail is discussed in Chapter Six.

1. Medium retail: Businesses with formal shops and premises, franchises are largely absent. A field study conducted by students of the University of Pretoria found that some businesses had been open for a day, while others had been open for over a century (almost the age of the city), results from the study are shown in the following graph.
2. Micro-enterprise: Often individual entrepreneurs without formally recognised premises, either mobile or fixed. Often regarded as informal, they are often recognised by their peers, with some vendors found by the author to have claimed occupation of a specific area of pavement in excess of ten years. These 'informal' vendors form part of an elaborate social network of vendors and suppliers, often working in collaborative syndicates and buying-groups.

Guide to Illustration - Contextual Character:	
1	Fixed Vendor sells fish (J Casson)
2	Pavement forms the Formal/Fixed vendoe interface. (author)
3	Fixed vending & congestion (author)
4	Typical shaded fixed vending stand (author)
5	Vending occurs in the shade (author)
6	A <i>Tshovador</i> rests next to his <i>Tshova</i> cart (J Casson)
7	A <i>Tshova</i> cart is unloaded at the Xiquelene market (author)
8	Mobile foot vendor sells nail-polish (J Casson)
9	Mobile foot vendors sell cashew nuts (J Casson)



Illus. 29: Baixa Commerce Map

The *Mercado Central de Maputo* (Maputo Central Market), a building and market square regulated by the Maputo municipality has been provided in order to provide for the micro-entrepreneurs. This is however, full to capacity, entrepreneurs who cannot fit into this confined area do not have any other choice but to sell on the streets without any infrastructural or hygiene facilities. Entrepreneurs who sell outside of the demarcated official areas are often harassed by city officials, a situation that is far from ideal.

It is possible to buy a wide variety of merchandise, from port related industrial machinery or farming equipment to clothing and fresh bread. This formal and informal commercial nature is a major contributor to the character of the

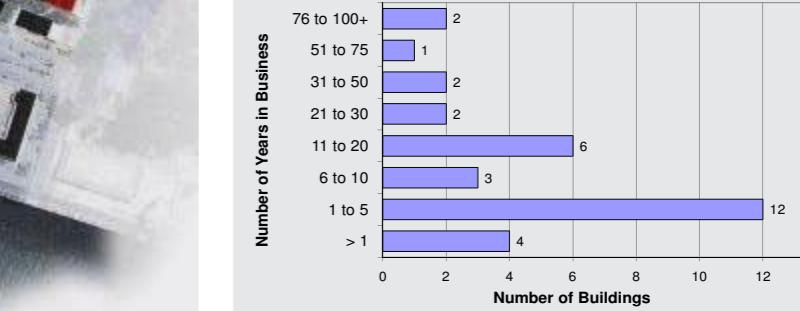


Fig. 8: Average Years In Business in the Baixa.

place, and new developments in this area should consider this contextual property with regards to programming.



Fluxing Use

A large portion of the users of the Baixa are informal traders, and that the significant portion of the public transport such as the *chappas* and busses operate informally, this means that the area is in constant flux, with no particular time schedule, but rather on-demand. Even the largest formal vehicular ferry operates formally on the informal 'on-demand' principle that it leaves 'when it is full'.

Traders and services, particularly micro-entrepreneurs, being involved in fairly marginal business, shift on-demand to meet changing hourly, daily, or monthly demand, and optimise business opportunities. This flux of use should be borne in mind at all stages of design.

Terminals

In the Baixa, busses and *chappas* operate from informal ranks on Ave. Guerra Popular with little formal infrastructure provided for the busses and *chappas*. This is partly due to the fact that both of these functions have developed and operate informally 'on-demand'.

Open Sites

According to Norburg-Schulz, time is "...the order of phenomenal succession and change" (Genus Loci: Towards a Phenomenology of Architecture, 1979: 56). In the Maputo Baixa this time related succession of change is particularly evident in the advent of abandoned sites, sites where the formal building has degraded to ruin, through fire or neglect. These spaces are not necessarily unused, and while some are still in decay, others serve as parking lots or formal basketball courts. These spaces leave a patchwork of spaces where the original function and building has decayed, allowing for new formal or 'on-demand' programming.

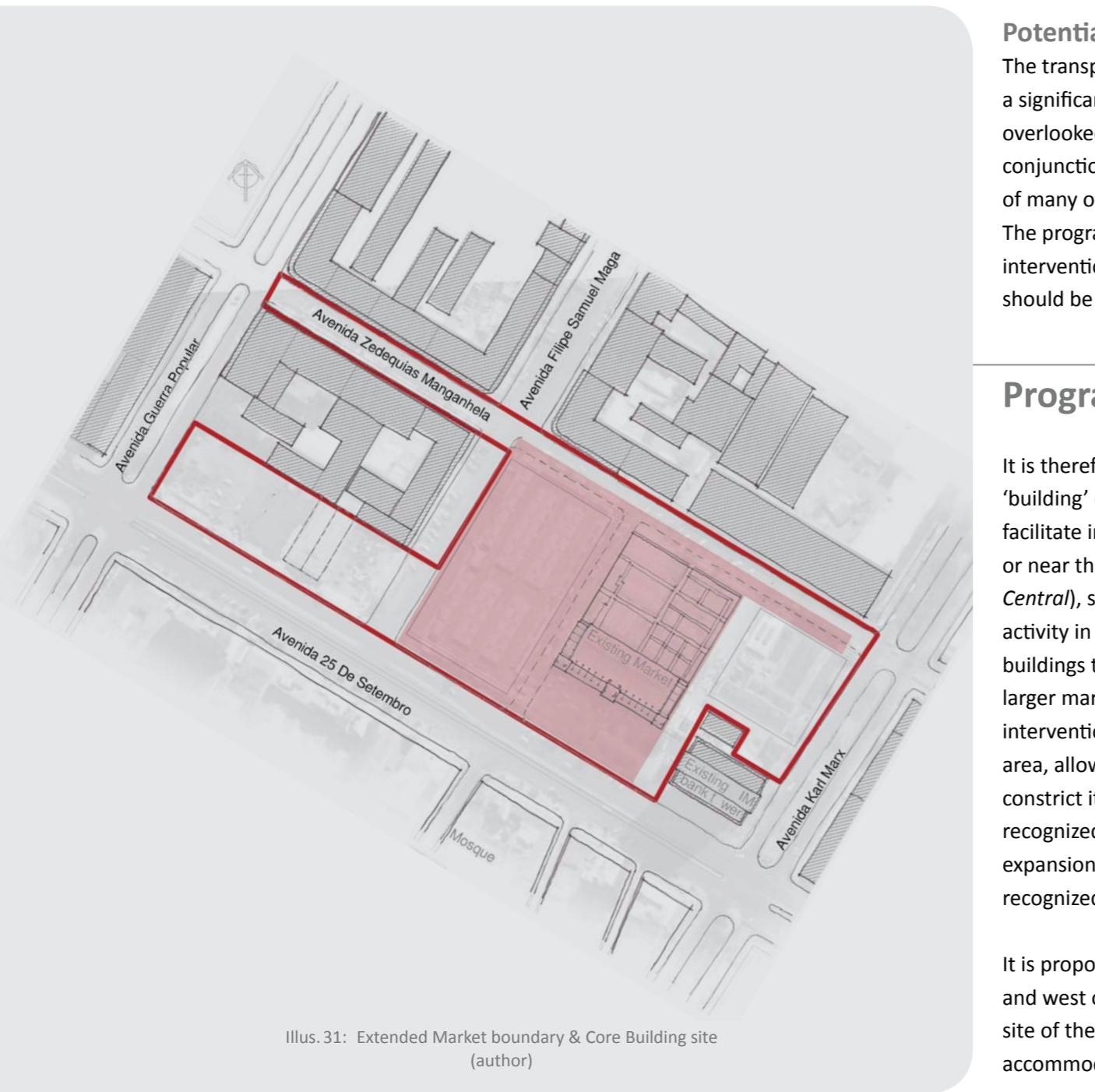
Demonstration of Need

The contextual and regional issues in the selected area all form part of the tangible and intangible 'given' fabric outlined below.

Contextual Identity

A harmony with current architectural tendencies, historic layering and heritage, needs to be sought in order to address the Critical Regionalist Ideals outlined in the normative position. This could be achieved through:

1. A detailed analysis of the discussed issues in specific relation to the site.
2. The evaluation of the contextual appropriateness of proposed materials.
3. The use of a building scale, massing, and spatial characteristics that respond to the existing circumstances.
4. An approach to the Heritage of the area.
5. Addressing the regional climate, in this way identifying with local buildings that do the same. Issues of stainability relating to climate then become an inherent part of the design



Potential

The transport related commercialism and fluxing use are a significant characteristic of the Baixa, and a relatively overlooked aspect of civic life in this area. This, in conjunction with the independent enterprising nature of many of the users is a major point of opportunity. The programming and function of an architectural intervention hoping to tap into this contextual potential should be that of transport and trade.

Program & Site

It is therefore proposed that the program of the 'building' on which this dissertation focuses should be to facilitate individual enterprise. And that it is located at or near the existing Central Municipal Market (*Mercardo Central*), since markets act as "...magnets of commercial activity in rapidly growing metropolises, the market buildings themselves become the de-facto center of larger market districts..." (Gantner, 2009: 2). Thus an intervention that aims to revitalise the current market area, allowing it to expand beyond the walls which constrict it. Vendors operating outside of the formally recognized market should be facilitated in this market expansion, and legitimized as part of the formally recognized economy, and legal system.

It is proposed that the sites immediately to the east and west of the existing Central Market, and the actual site of the existing market be used to create spaces to accommodate this program.