

# Chapter 3: Engaging with the Network

“WE ARE RESISTING THE NOTION THAT LAGOS REPRESENTS AN AFRICAN CITY EN ROUTE TO BECOMING MODERN.

RATHER, WE THINK IT POSSIBLE TO ARGUE THAT LAGOS REPRESENTS A DEVELOPED, EXTREME, PARADIGMATIC CASE STUDY OF A CITY AT THE FOREFRONT OF GLOBALIZING MODERNITY.

THIS IS TO SAY THAT LAGOS IS NOT CATCHING UP WITH US.

RATHER, WE MAY BE CATCHING UP WITH LAGOS.

THE AFRICAN CITY FORCES THE RE CONCEPTUALIZATION OF THE CITY ITSELF.

(KOOLHAAS, 2009;193)

Illus: 31 Symbol of the social capital - the act of self guidance and control (Author, 2011)

## 3.0.1 PROBLEM STATEMENT

**DESIGN PRINCIPLES THAT UNDERPIN ARCHITECTURAL INTERVENTIONS IN DEVELOPING AREAS DO NOT FULLY EMBRACE THE FLUXUAL NATURE OF THE CONTEXTUAL NETWORKS.**

In order to design an intervention that supports an intangible network, a process of engagement is required to investigate the requirements of a host network, in this case the building retail network of Mamelodi, Gauteng.

Mamelodi, Gauteng has been chosen as the laboratory of research due to the current influx from rural environments, rapid rate of urbanization, mass housing projects and termed 'informality'.

## PART 1: BACKGROUND TO THE NETWORK

A brief overview of the developmental history and context in which the research was conducted.

## PART 2: THE INTANGIBLE NETWORKS

An initial site visit revealed a potential network around the Mamelodi Brickyards. This was followed up with a 10 day documentation process.

## PART 3: ANALYSIS OF FINDINGS

Several emergent concepts based on observed site conditions are analyzed and translated into architectural themes.

### 3.0.2 CONSIDERING AN INTERVENTION

When engaging with a context such as South Africa's developing areas, it is extremely difficult to find design generators in their traditional form as the nature of these environments is so fluid and the social hierarchy so organically structured.

This fluidity is noted by John Habraken who states that "*The built environment has always been self organizing*". He further explains that professionals will always be intervening in natural and ongoing process.

Despite the design professional's increasing ability to effect large scale change in the built environment, it will always follow its own laws. (Habraken, 2008:326)  
Habraken speaks here of the nature of the human spirit reflecting itself through its environmental manifestation from the micro through to the macro.

Human creativity is irrepressible. The desire to invent, renew, and re-interpret makes environments bloom. Designers tend to record the innovative while ignoring the familiar, but the familiar, which designer initially depend on, will eventually transform it. (Habraken, 2008:316)

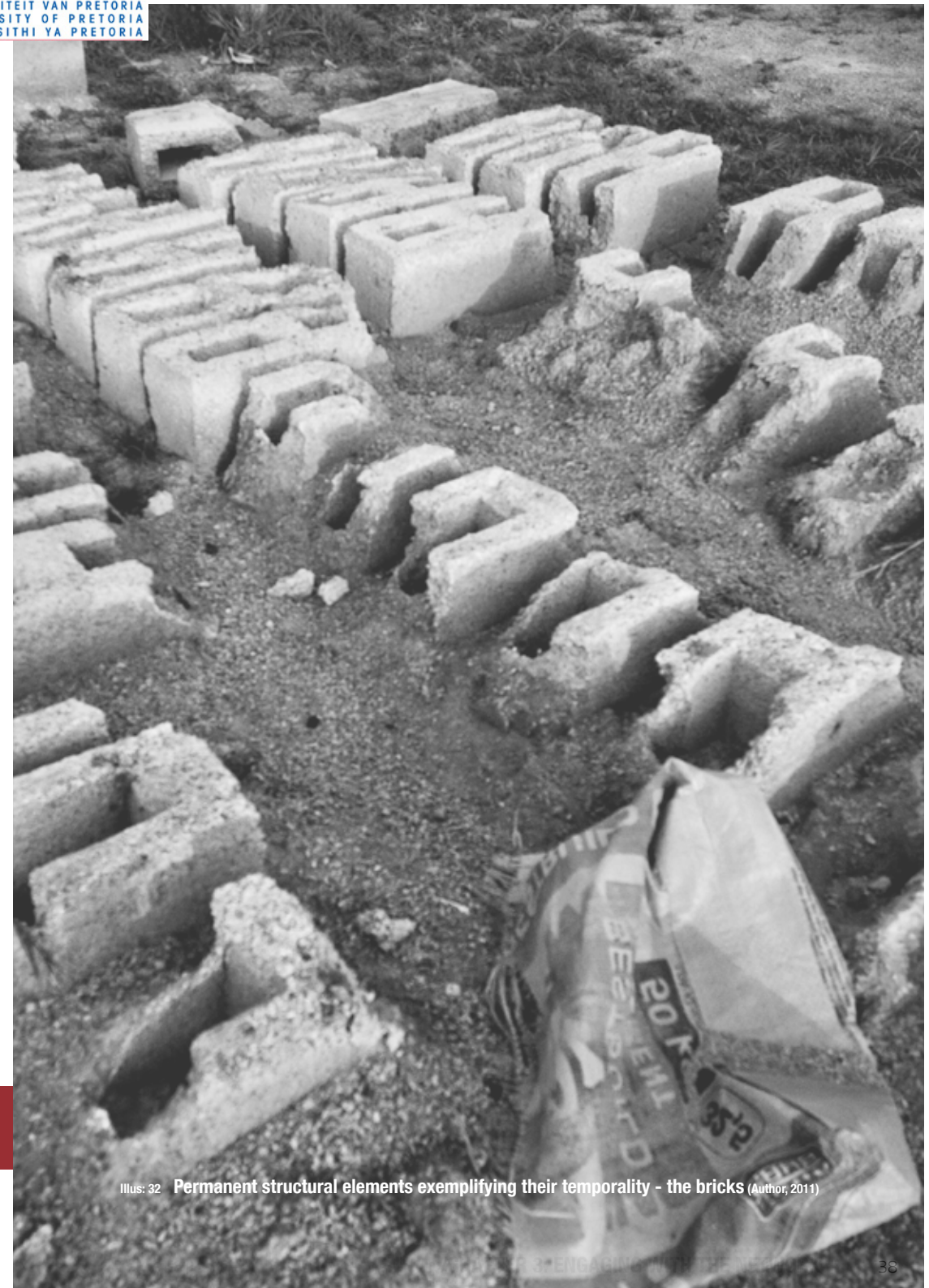
Through a process of engagement the aim of this chapter is to not only engage with a network, but to identify where the familiar will generate form and spatial thematic design informants to create a successful intervention based from the roots up.

Habraken states that the act of building, by professional or inhabitant, is an expression of control over form. Although it takes place while a building takes shape, it is ultimately temporary. (Habraken, 2008:88)

This notion is key, especially in the context of Mamelodi. He offers further that once building is complete inhabitation takes over. Eventually habitation will trigger additional transformation over form. The act of building then resumes. (Habraken, 2008:88)

A corresponding space formed by physical parts is not required for territorial space to exist. All that is needed is an agent exercising spatial control (Habraken, 2008:129)

The principle taken from Habraken's work is that a traditional intervention is not necessarily the only way to engage with such a fluid and dynamic context.



Illus: 32 Permanent structural elements exemplifying their temporality - the bricks (Author, 2011)



## PART1: MAMELODI IN CONTEXT

### DEMOGRAPHICS

<b>TOTAL POPULATION:</b>	359 122
<b>HOUSEHOLDS:</b>	106 670
<b>AVE HH SIZE:</b>	3.4
<b>AVE POPULATION DENSITY:</b>	9 415.5 km <sup>2</sup>
<b>ECONOMICALLY ACTIVE POP:</b>	70%
<small>(GAPP [Demacon],2010:149)</small>	

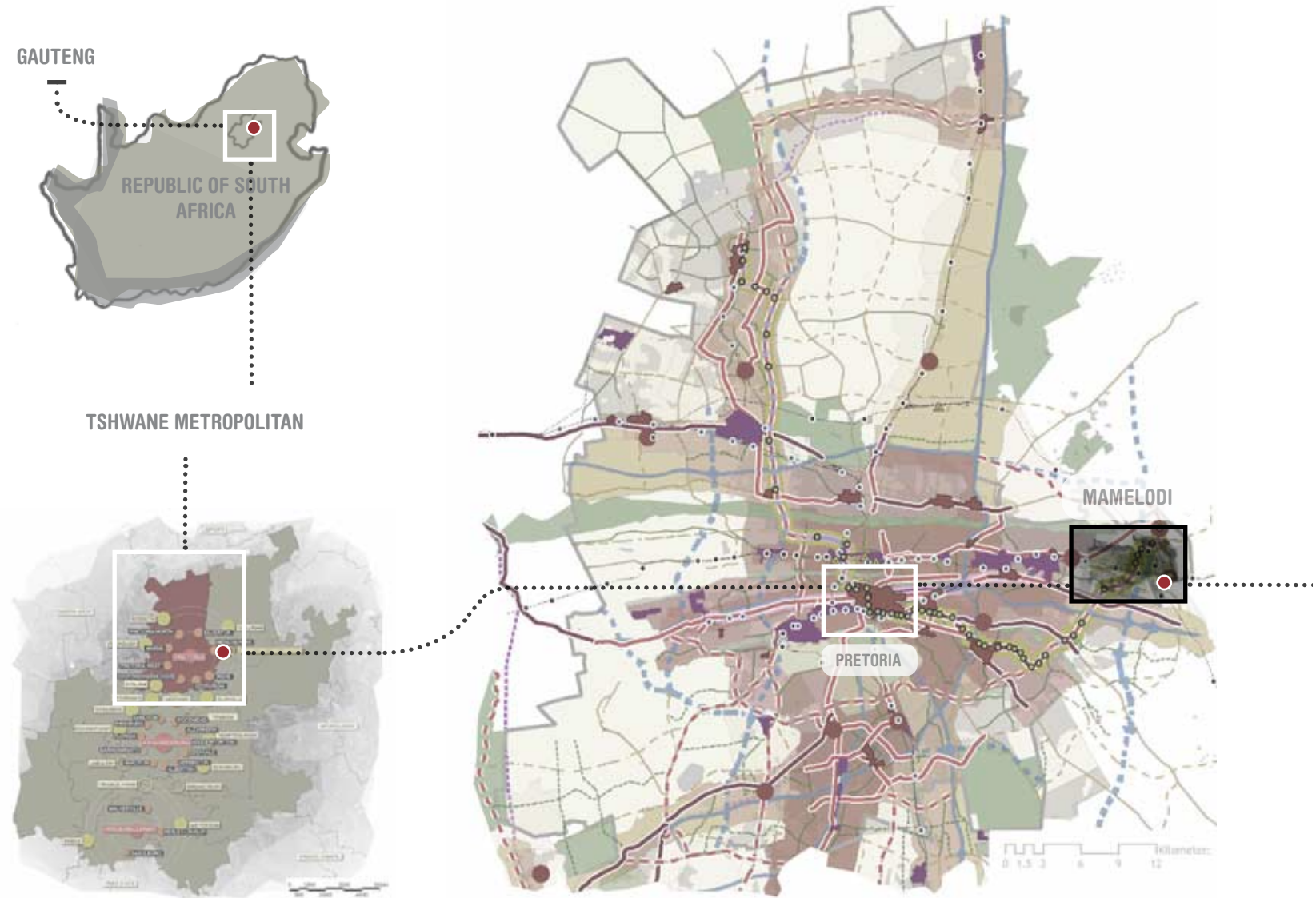
### RETAIL IN MAMELODI

<b>MAMELODI CROSSING:</b>	41.2%
<b>MAX CITY:</b>	6%
<b>OUTSIDE MAMELODI:</b>	54.2%
<small>(GAPP [Demacon],2010:180)</small>	

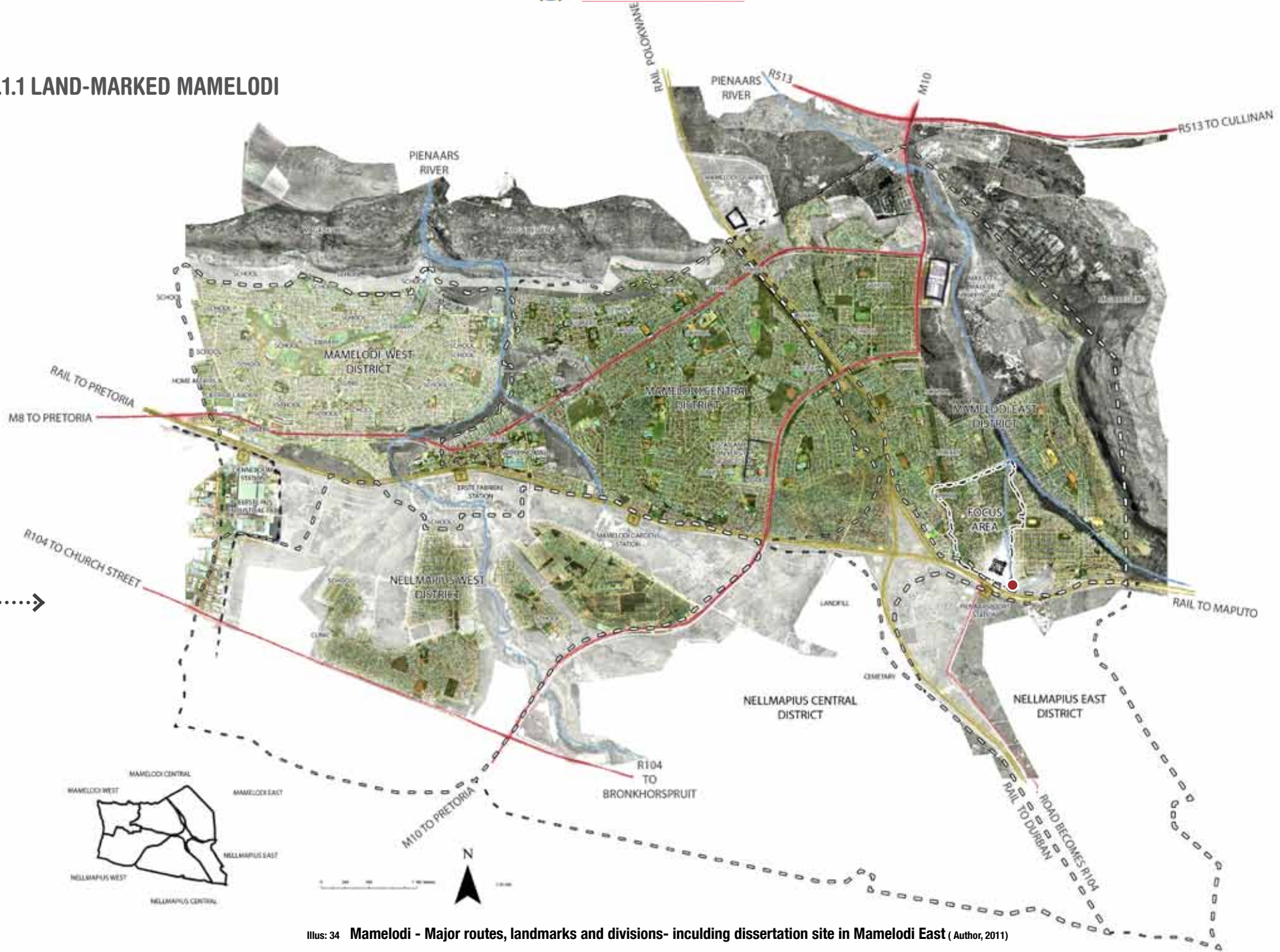
Mamelodi has a rich history of development alongside Pretoria's own growth, and still provides a buffer for the rural population who wish to move closer to the urban centre of Tshwane.

Mamelodi is the one of the oldest 'townships' in South Africa, as a result the inhabitants have access to older and relatively larger infrastructure in comparison to more temporary settlements that have emerged in Gauteng's post apartheid era.

The average household income by 60% of the inhabitants is more than R3 000 a month (GAPP [Demacon],2010: 155-158) while transport is still primarily by foot at 36.4% (GAPP [Demacon],2010: 155-158) While more than 78% of residents have access to basic services there is still an ever growing non-serviced portion of the population that is constantly augmented by rural migration. (GAPP [Demacon]2010: 161)



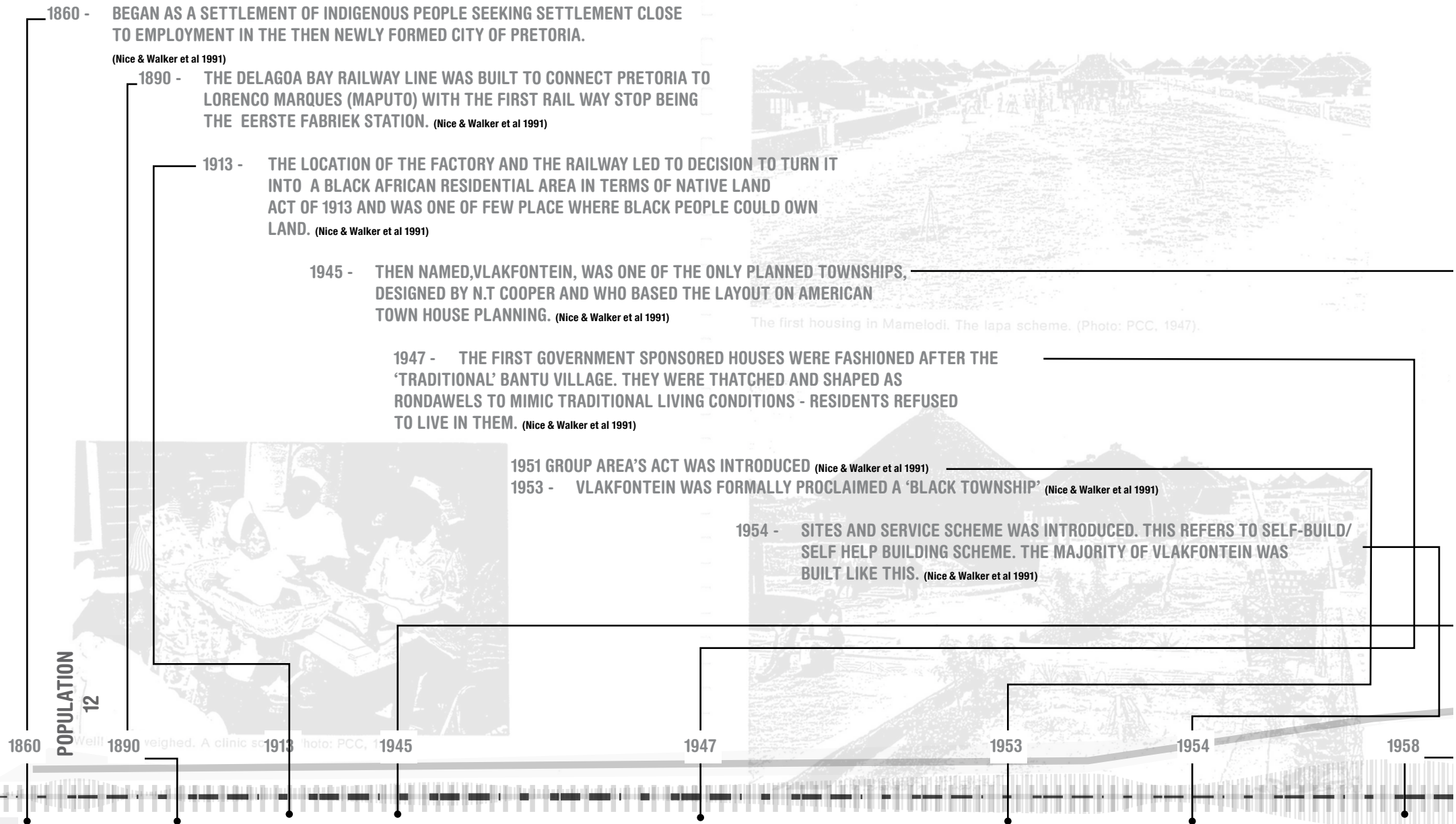
### 3.1.1 LAND-MARKED MAMELODI



Illus: 34 Mamelodi - Major routes, landmarks and divisions- including dissertation site in Mamelodi East ( Author, 2011)



### 3.1.2 HISTORIC BACKGROUND TO MAMELODI



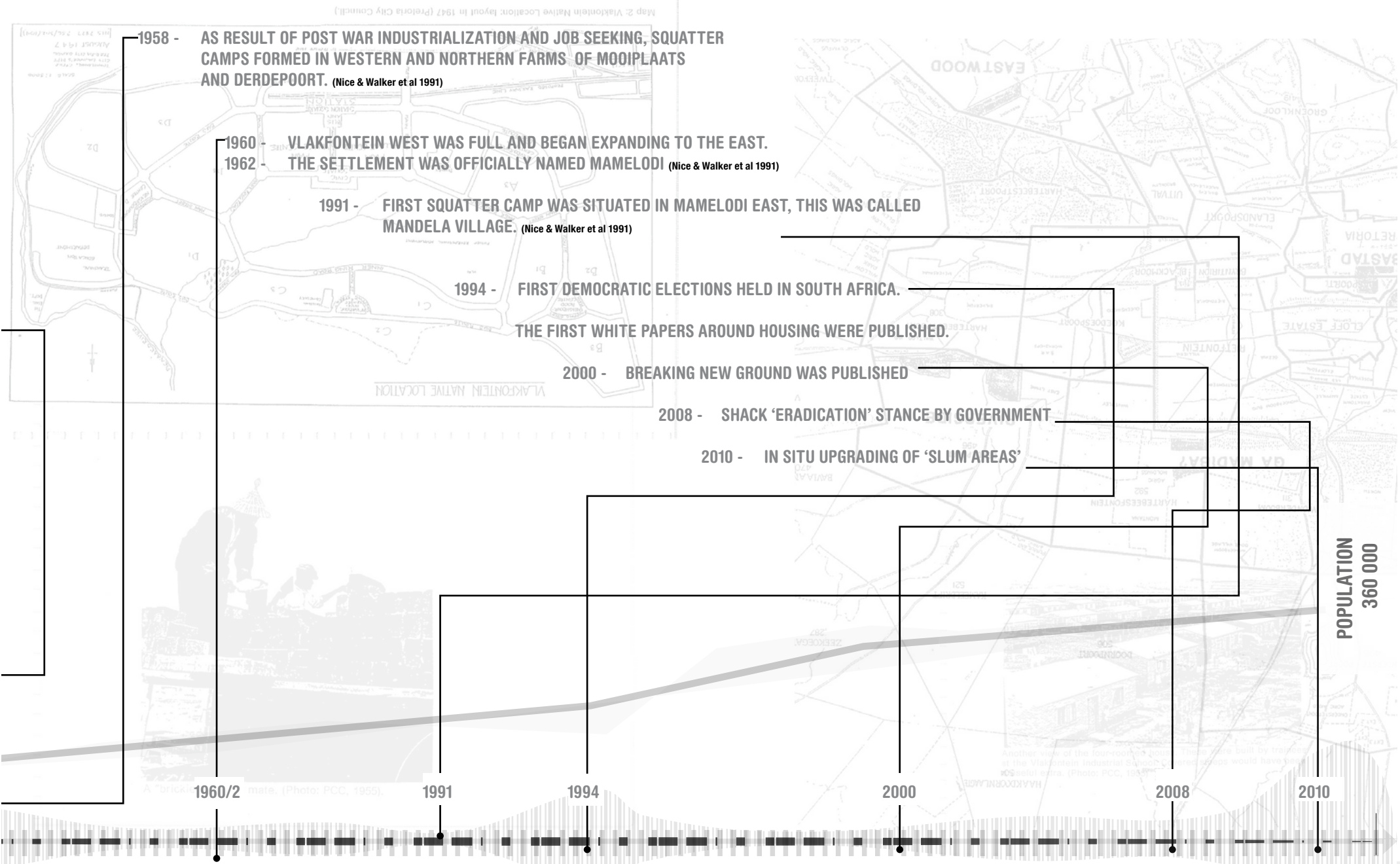
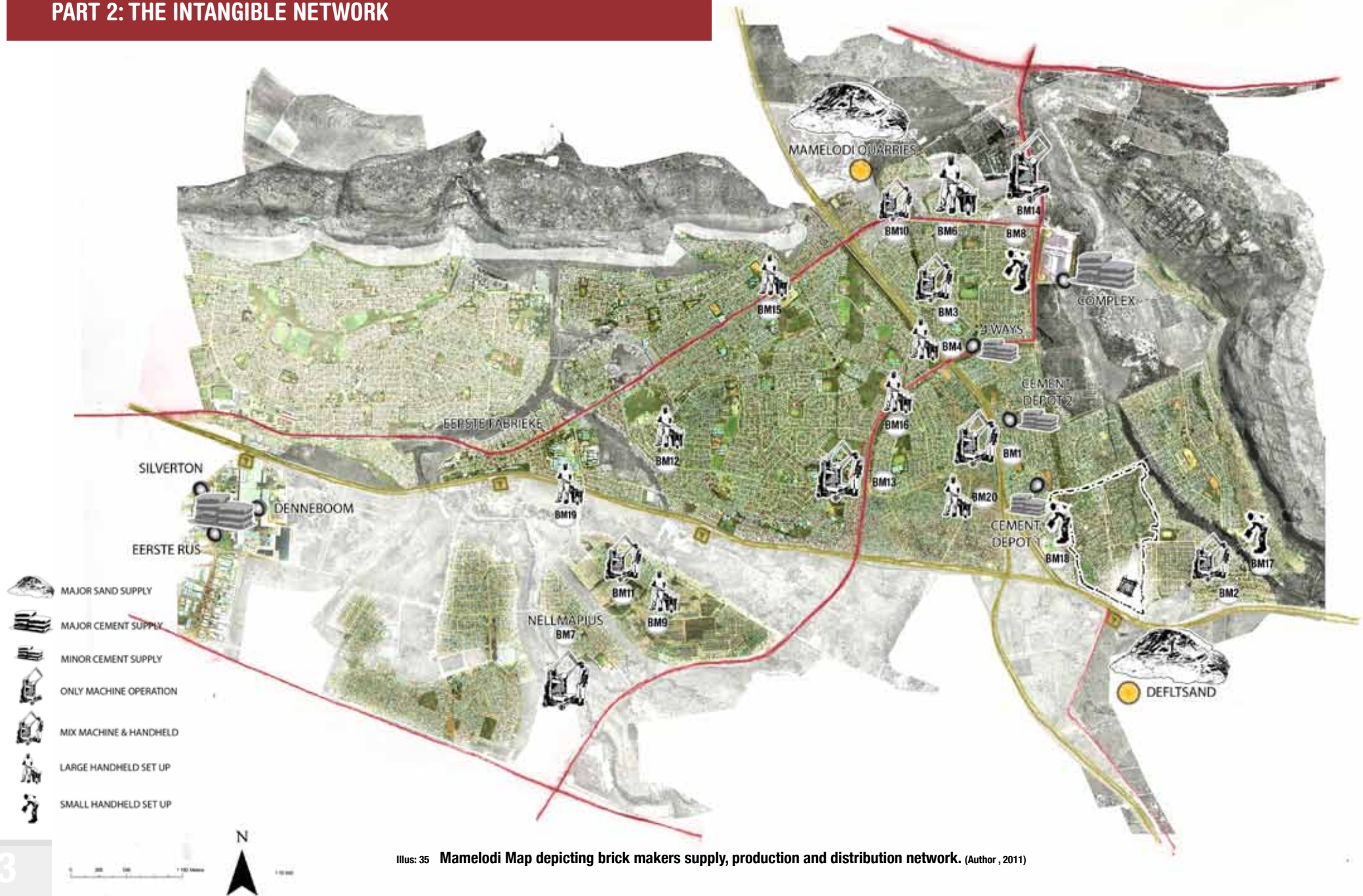


Fig: 6 Historical flux around development of Mamelodi (Author, 2011) (Nice & Walker et al, 1991)



## PART 2: THE INTANGIBLE NETWORK

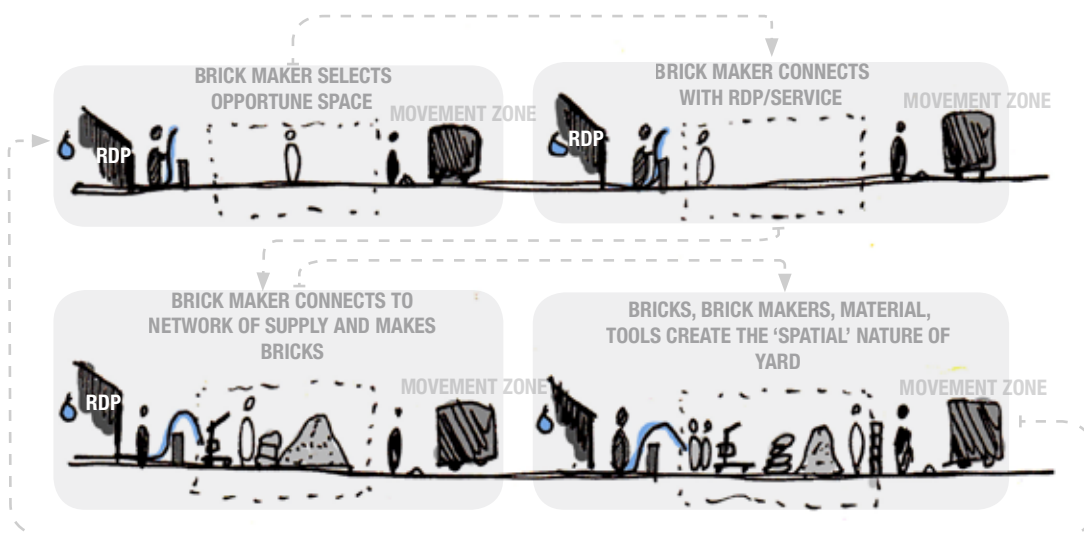


Illus: 35 Mamelodi Map depicting brick makers supply, production and distribution network. (Author, 2011)



Illus: 36 Family Planning- a brickyard in Mamelodi East (Author, 2011)

#### BRICK MAKERS PROCESS OF SPATIAL APPROPRIATION



Illus: 37 Diagram depicting the brick makers process of appropriation (Author, 2011)

### 3.2.1 CEMENT BRICK MAKERS OF MAMELODI

During the initial site visits to Mamelodi, the discovery of several backyard brick factories was made. Initially these businesses seemed haphazard, but after a brief interview there appeared to be a larger network behind the small businesses.

It emerged that there was a larger supply chain of resources and a market that fed the demand for cement bricks. Upon a closer inspection these bricks were being used to supplement and add to the government provided housing. The bricks were also being used to support temporary housing in the developing areas of Mamelodi.

Many of the brick makers were registered companies and managed by a family member. And generally were supplementary businesses to other forms of income. (see Illus: 37)

### 3.2.2 PATTERNS OF APPROPRIATION

The brick making businesses themselves appeared to operate in a similar fashion to the temporary housing (see Illus: 37):

- They select an appropriate area close to major transport routes,
- Make contact with a water source; municipal supply or river,
- Procure material from local distributors,
- Use the bricks themselves to create temporal space, to advertise bricks and channel in potential customers.

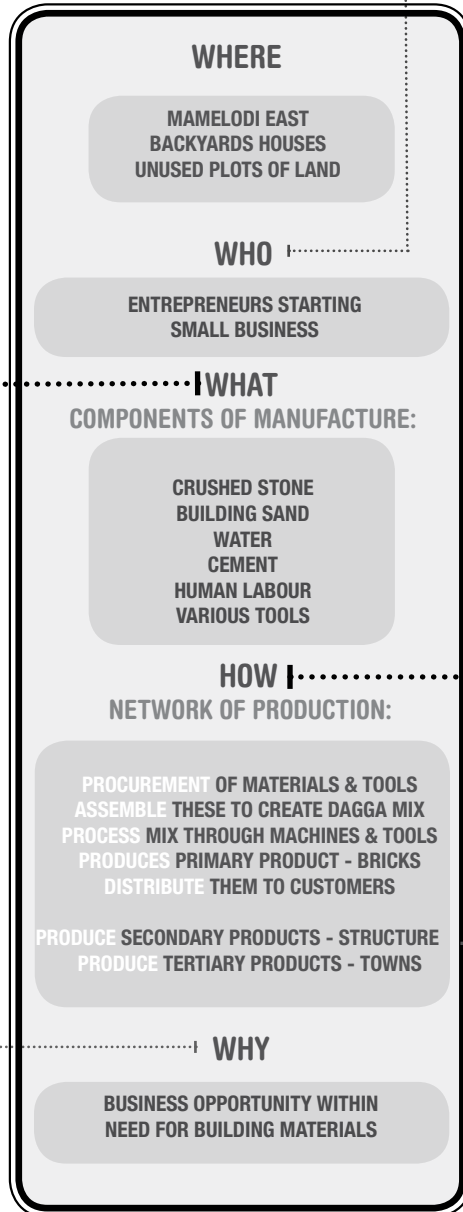
### 3.2.3 FIELD RESEARCH CONDUCTED

A further study was conducted over a ten day period with measured results being taken from several interviews with the brick makers.

The process of engagement with the brick makers was documented and captured by photographic, video and field notes. (see Appendix Illus: 2) on (page 153)

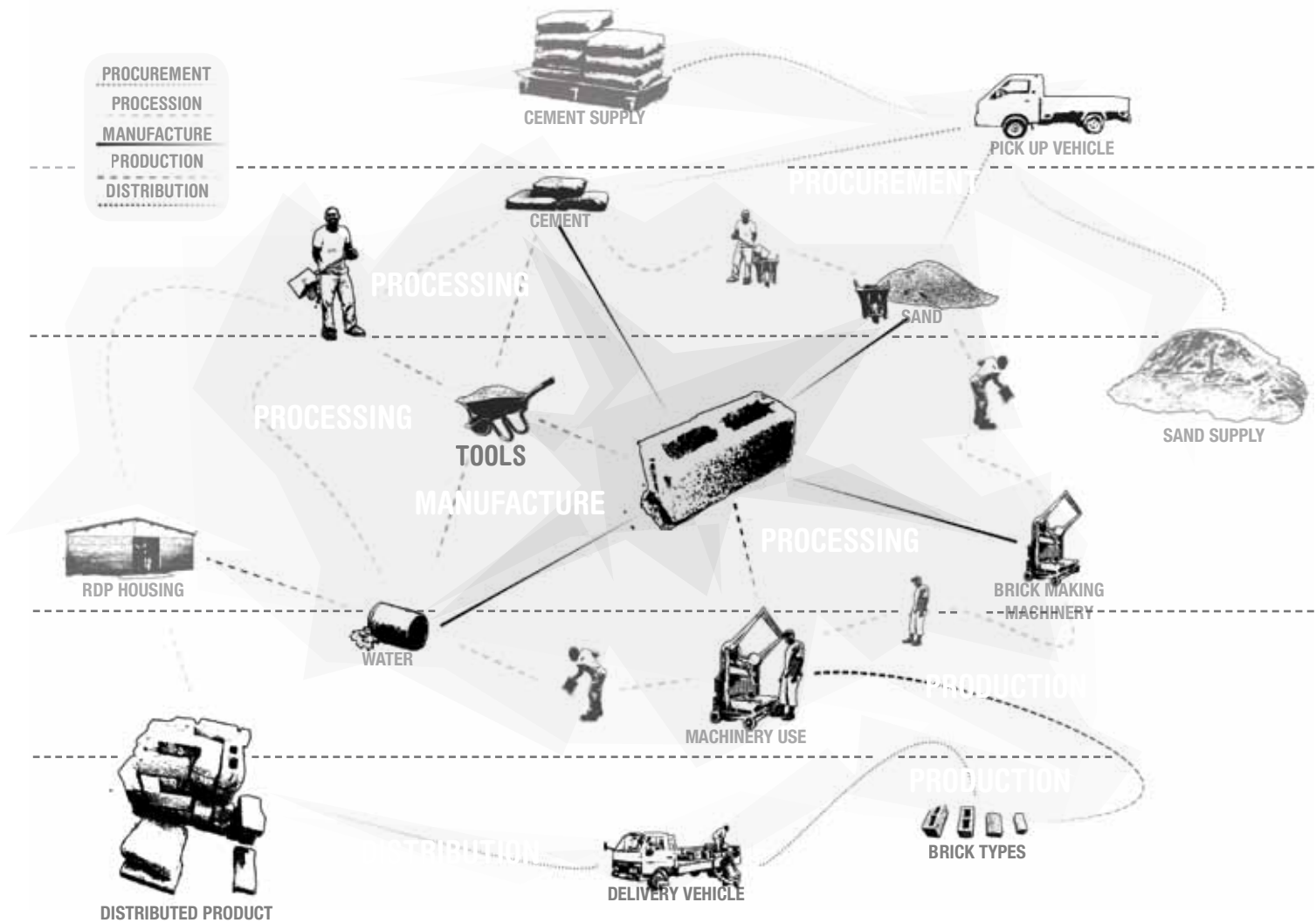
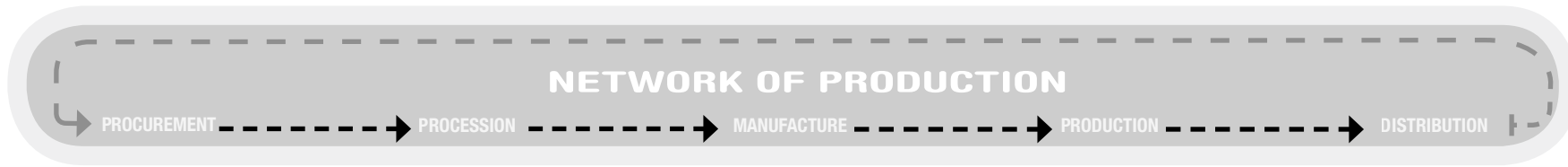


### 3.2.3 STUDY OF ACTIVITIES INVOLVED IN CEMENT BRICK MAKING PROCESS



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Illus: 38 Profiles of cement brick makers in Mamelodi (Author, 2011)



Illus: 39 Diagram depicting the discovered network of production around cement brick makers (Author, 2011)



### 3.2.4 SUMMARY OF FIELD RESEARCH

The initial research study was held over a period between April and May of 2011.

Over twenty recorded interviews were conducted, with thirteen unrecorded interviews taking place and twelve independent site visits. (see Appendix Illus: 3, on page 154)

During the ten days on-site investigation into the processes around the Mamelodi brick makers, several core findings became clear:

**THE CONNECTIONS BETWEEN THE BRICK MAKERS LIE MAINLY IN THE SUPPLY AND DISTRIBUTION OF THE MATERIALS USED: I.E SAND, CEMENT & WATER.** (see Illus: 42)

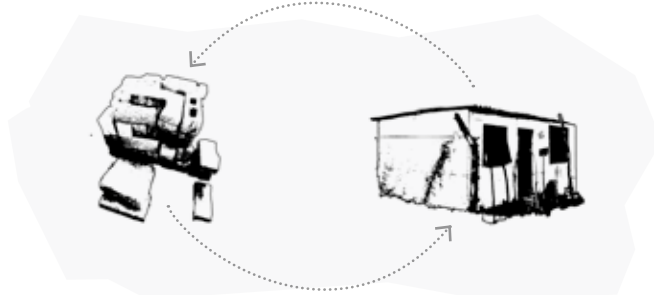
**GENERALLY THE BRICK MAKERS HAVE A STRONG CONNECTION WITH TRANSPORT NETWORKS IN THE AREA AS WELL AS THE GOVERNMENT SUPPLIED SERVICES AND HOUSING IN THE FORM OF WATER AND BASIC SERVICES.** (see Illus: 39)

**PEOPLE BUY MATERIALS FAIRLY INCREMENTALLY, LEAVING BRICKS AND OTHER BUILDING MATERIAL AROUND THEIR HOMES.** (see Illus: 44)

**THE FORMS OF SUPPLY EXIST AS A BALANCE OF CENTRALISED AND DE-CENTRALISED SOURCES, EACH FUNCTIONING TO VARIOUS SECTORS OF THE MARKET.**

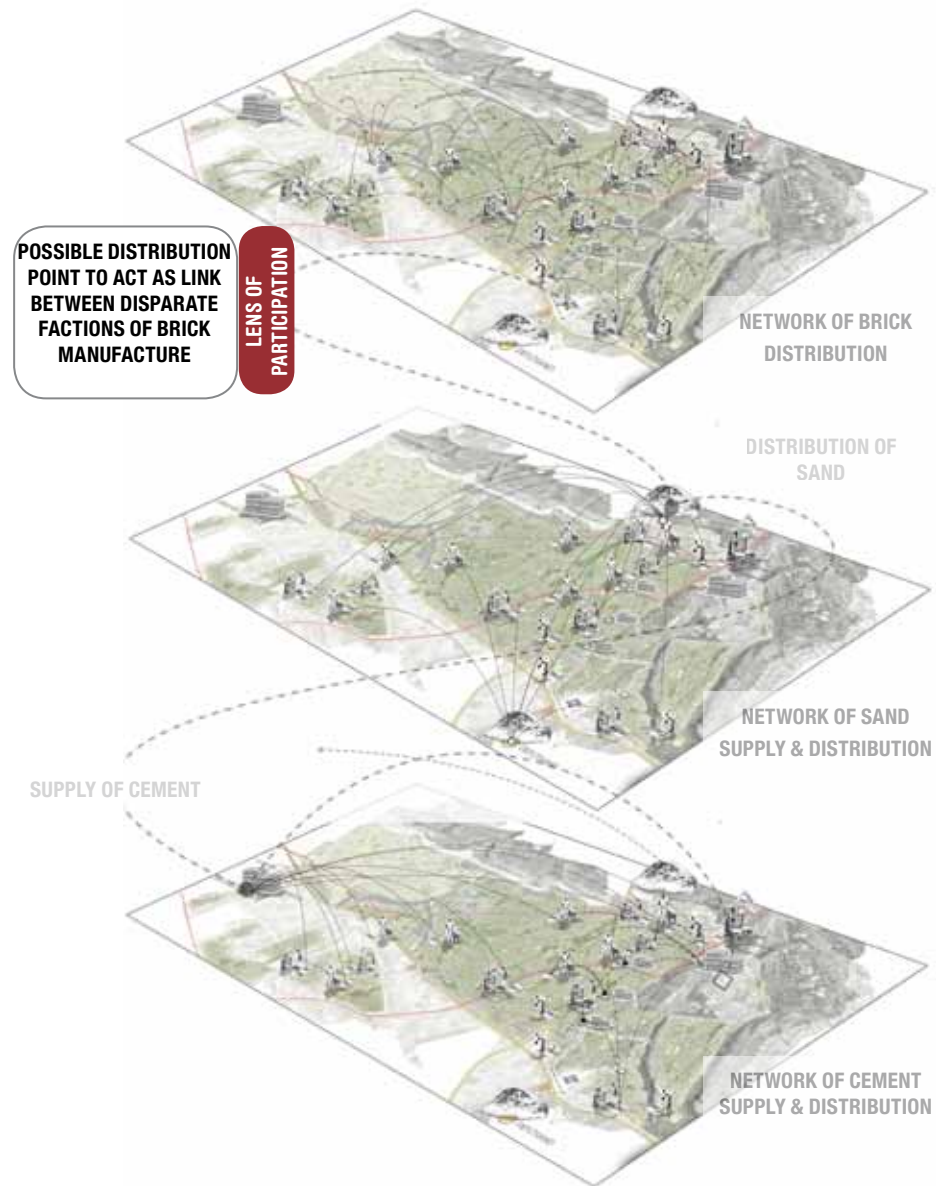
**THE BRICK MAKERS EXPRESSED MAJOR CONCERN ABOUT THE SUPPLY AND DISTRIBUTION OF RESOURCES IN TERMS OF SUPPLY AND DEMAND OF BRICKS VS CAPITAL EXPENDITURE ON STOCK.** (Appendix Illus: 8, page 159)

**THERE APPEARED TO BE A RECIPROCAL RELATIONSHIP BETWEEN THE BRICK MAKERS AND THE TEMPORARY HOUSING.** (see Illus: 42)



Illus: 42 Identification of link between brick makers and housing through resource use i.e. water and space (Author,2011)

### CONNECTIONS BETWEEN BRICK MAKERS & SUPPLY NETWORK



Illus: 41 Identification of connections between brick makers and supply points through lens of participation (Author,2011)



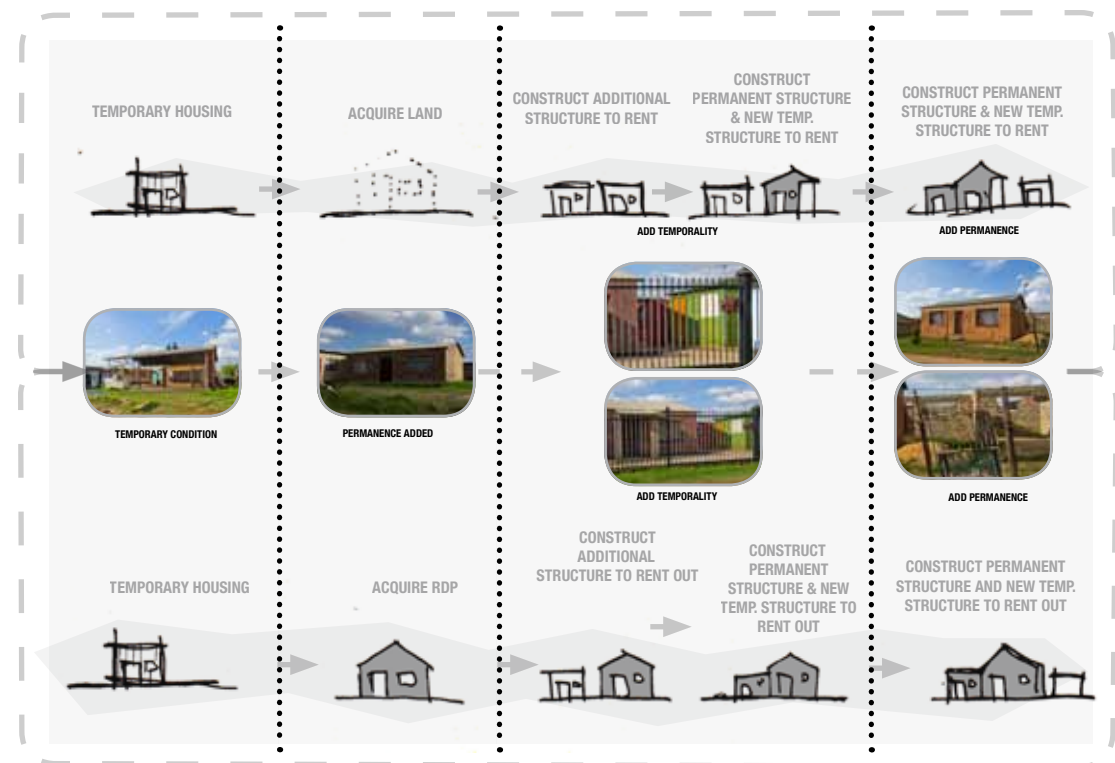
Illus: 43 States of observed flux within self built homes (Author, 2011)

### 3.2.5 OBSERVED STATES OF FLEXIBILITY IN GROWTH

While investigating the brick makers, certain patterns around the growth and decay of the houses began to emerge. Wages are used sparingly to buy small amounts of building materials which sit outside homes long before the 'final' product is built. (see Illus: 43)

The growth patterns of homes were observed and noted to have been in steady but varied states of growth and adaptation, according to home owners or residents needs, requirements or available funds. (see Illus: 44)

Structures that appeared 'permanent' and fixed were highly mobile and adaptable, being changed and moved according to the needs of the inhabitant, sometimes on a daily basis.



Illus: 44 Diagram depicting the states of flux within Mamelodi homes (Author, 2011)



### 3.2.6 OBSERVED STATES OF MOBILITY IN GROWTH

During an early morning interview on the 25 of June, several occupants of Pienaarspoort, Extension 12, were interviewed in their homes around the Pienaarspoort Station. Later that afternoon, the same residents had moved their entire dwellings to an adjacent site on the orders of a municipal body.

Not only were their structures highly adaptable and flexible they had a heightened mobility that resembled a caravan more than a fixed home. (see Illus: 45)

Certain commercial structures throughout Mamelodi exhibited similar aspects of mobility in the form of Container shops, fruit and vegetable stands (*stalletjies*) and various other commercial operations that ran from these mobile platforms.

Amidst various states of flux there appeared to be several connections between the structures and the occupants. (see Illus: 47), (see Illus: 48), (see Illus: 49), (see Illus: 50)

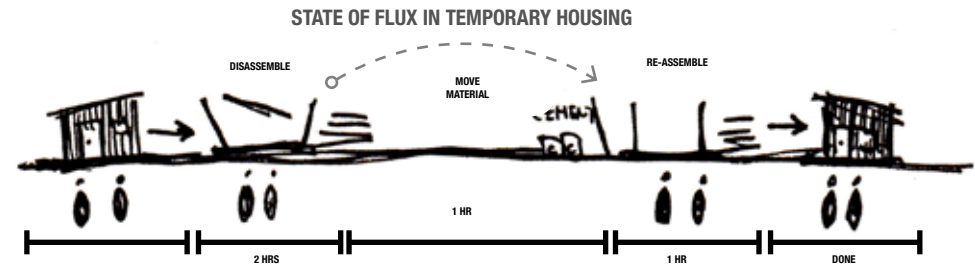
From this observation certain key concepts emerged:

#### STRUCTURE IN MAMELODI EXISTED IN VARIOUS STATES OF:

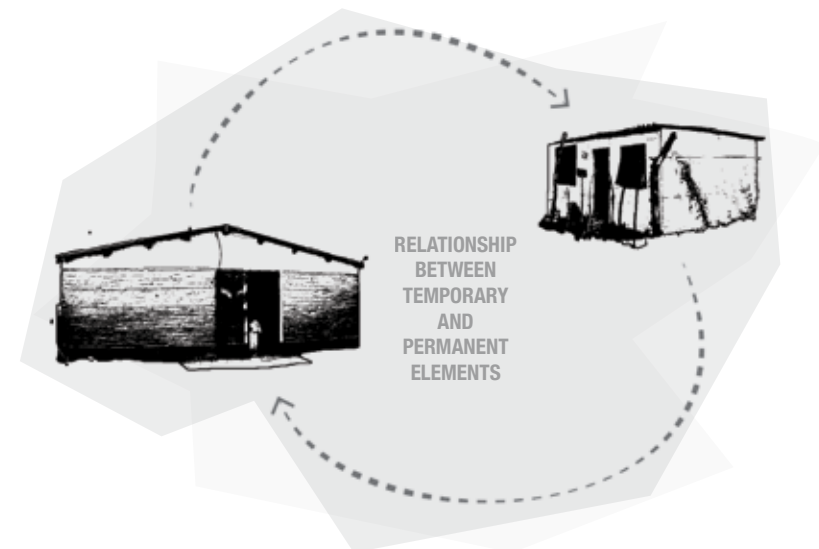
- TEMPORALITY
- PERMANENCE (IN FORM)
- MOBILITY
- FIXITY (IN LOCATION)

THESE VARYING STATES OF EXISTENCE CREATE VARIED STATES OF FLUX IN THE NATURE OF THE STRUCTURES AND THE PROCESSES AROUND THEM. (Illus: 52, page 51)

THERE APPEARED TO BE A STRONG LINK BETWEEN THE PERMANENT STRUCTURAL ELEMENTS AND THE TEMPORARY IN HOW THEY EACH FACILITATED THE OTHER DURING THE PROCESS OF STRUCTURAL GROWTH (CONSTRUCTION). (see Illus: 46)



Illus: 45 Observed relationship between temporary brick makers and permanent housing (Author, 2011)



Illus: 46 Relationship between temporary and permanent housing elements in structural growth (Author, 2011)

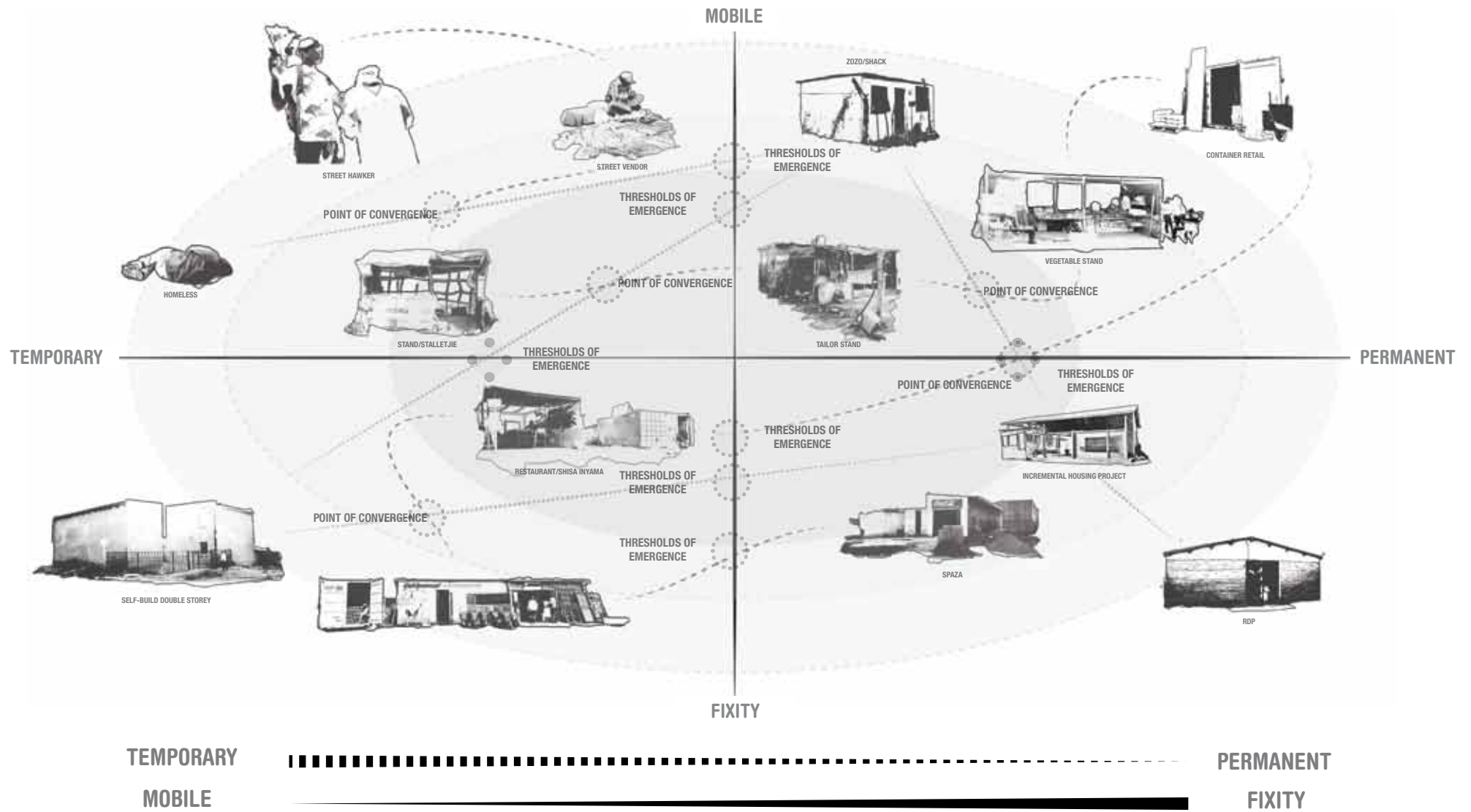


Illus: 48 RDP with potential future growth (Author, 2011)

Illus: 49 Self-build with future bricks in yard (Author, 2011)



PART 3: INTERPRETATION OF FINDINGS



Illus: 51 Diagram depicting the Methodology of emergence through states of fluxual growth as seen in Mamelodi (Author, 2011)

### 3.3.1 KEY FINDINGS - SUMMARY

Through the process of engagement with the brick makers of Mamelodi and the elements in their network of production, a strong theme emerged:

**A SENSE OF STRUCTURAL MOBILE FLEXIBILITY ENABLING A FLUXUAL GROWTH OF LARGER STRUCTURAL BODIES THROUGH STATES OF TEMPORALITY AND PERMANENCE.**

### 3.3.2 PERMANENCE VS TEMPORALITY

In the context of Mamelodi, there appears to be a hierarchy within the levels of permanence and temporality attached to various elements, structural and personal. A person is not limited by mobility, but enhanced by it.

The aspects of temporality provide a flexible structure for an individual, through thresholds of emergence, to gain permanence as when needed. (see Illus: 52)

John Habraken describes this condition as the human instinct that drives one to build, to endure and to resist time, although one knows that ultimately time will win. As humans we instinctively seek permanence. (Habraken,2008: 8) (see Illus: 52)

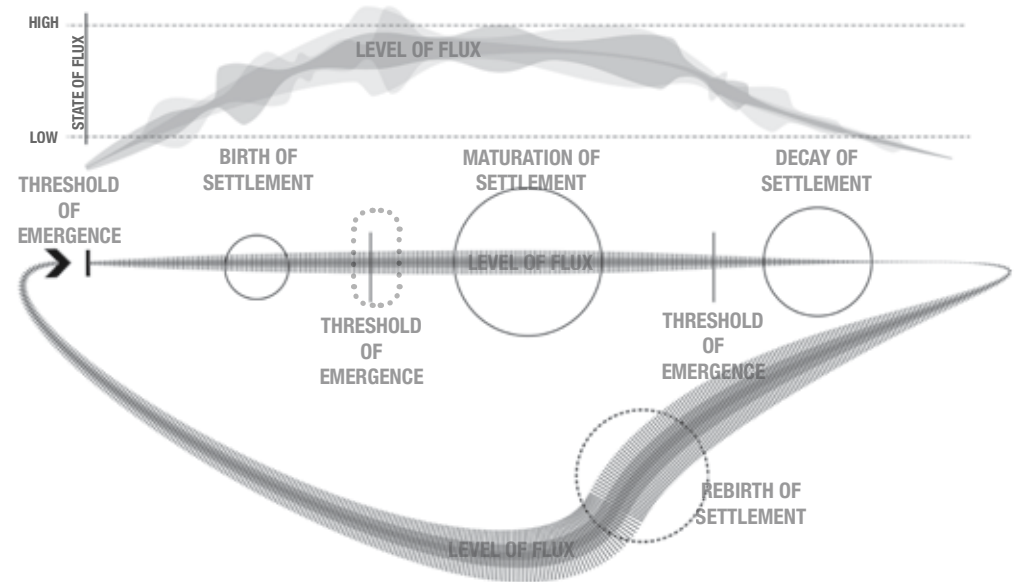
He describes how a detached observer could recognize the builder as an agent of change, but in fact the builder is an actor who, in striving for permanence, engages the existing context and transforms what is there. (Habraken,2008: 8)

The built environment, like all complex phenomena, artificial and natural, endures by transforming its parts. (Habraken,2008: 7)

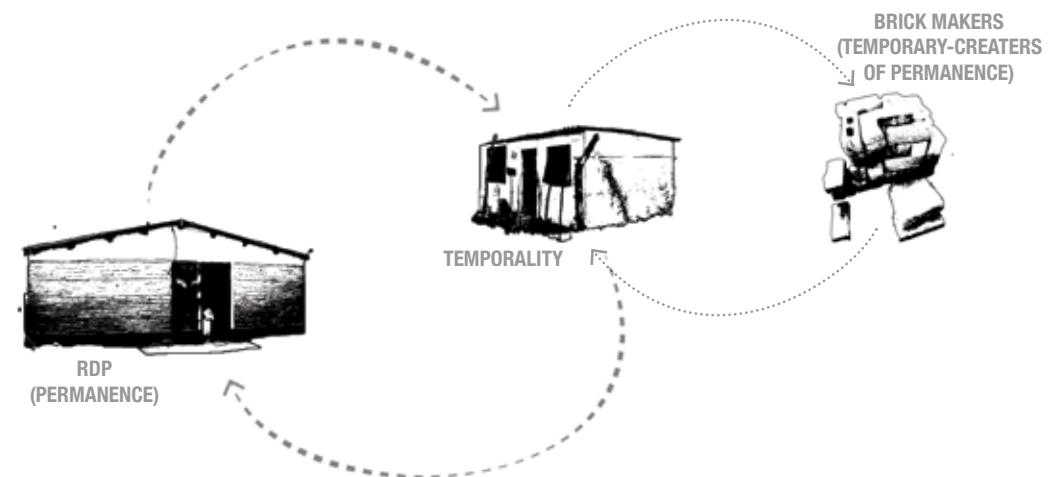
The context of Mamelodi exemplifies this condition in the respect placed on brick housing. Permanence, in the form of bricks, is a symbol of status in the context of developing South Africa. (see Illus: 54)

Habraken draws the metaphor of the built environment as an organism, only so by virtue of human intervention.

The human elements manifested in structure give life and create the spirit-of-place as long as people are actively involved and find the built environment worth renewing, altering, and expanding. Only then it will endure. (Habraken,2008: 7)



Illus: 52 Interpretation of Habraken's patterns of permanence in settlement (Author, 2011)



Illus: 53 Larger connections between RDP and brick makers through temporary housing. (Author, 2011)



### 3.3.3 MOBILITY

Tim Creswell notes mobility's inherent duality as a product of social relations that simultaneously acts as an agent of social production. (Edjabe [Creswell] 2011: 169)

In the case of the Cement Brick Network of production, the aspect of mobility is key in terms of accessing services, supply and distribution.

Creswell defines mobility in terms of 6 key factors:

THE STARTING POINT	- WHY DOES A PERSON OR THING MOVE?
SPEED	- HOW FAST DOES A PERSON OR THING MOVE?
RHYTHM	- IN WHAT RHYTHM DOES A PERSON OR THING MOVE?
ROUTING	- WHAT ROUTE DOES IT TAKE?
EXPERIENCE	- HOW DOES IT FEEL?
FRICTION	- WHEN AND HOW DOES IT STOP?

### 3.3.4 MOBILITY AS A SYMBOL

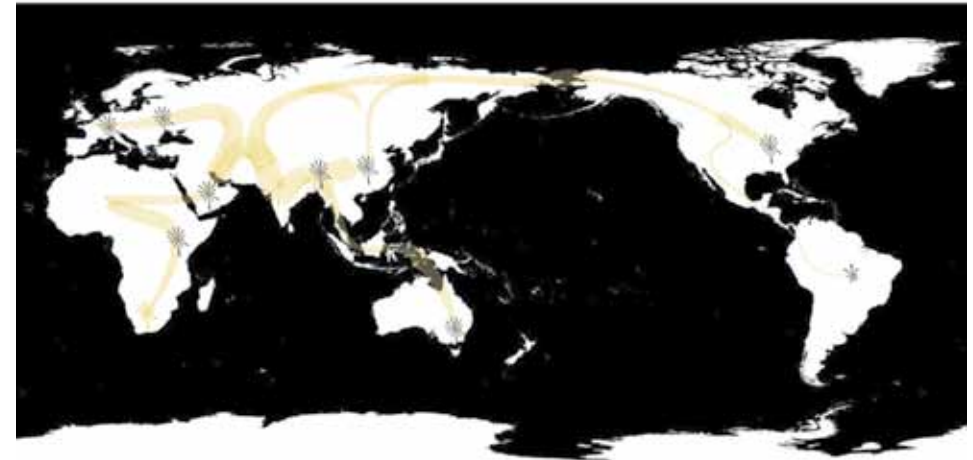
Although one could see the mobile world as something that replaces a foxed world, Creswell points out that one needs to constantly consider fixity and friction in contrast to mobility within its context. (see Illus: 54), (see Illus: 55)

Mobility has been described as dysfunctional, as inauthentic and rootless and, more recently, as liberating, anti foundational and transgressive in forms of representation. (Edjabe [Creswell] 2011: 168)

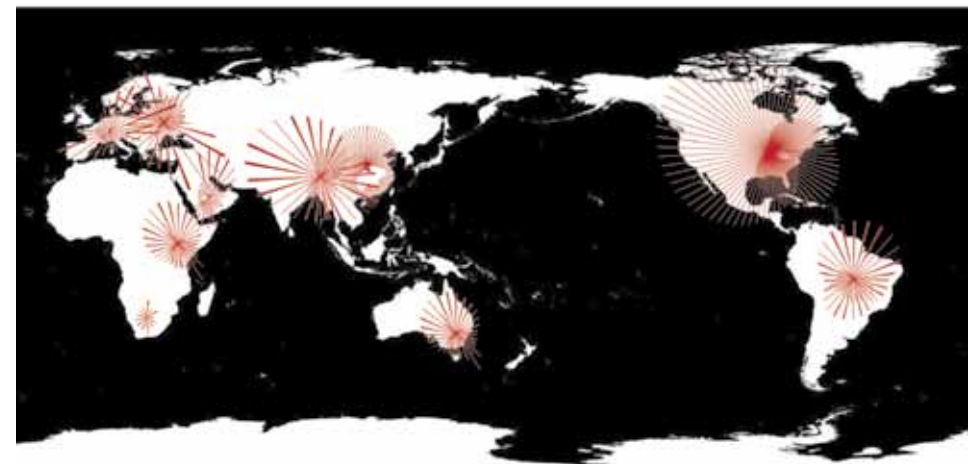
During a conference at The University of Witwatersrand's *Faces of the City* seminars Dr. Megan Jones presented her finding around themes of masculinity and mobility in the townships of South Africa.

Dr Jones discussed how during apartheid movement was controlled by the Pass Laws and the Group Areas Act and that after the regime change the free movement of the population was a notable symbol of expression by the South African people.

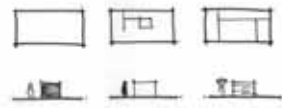
Mobility, in the South African context, can be regarded as an expression of freedom.



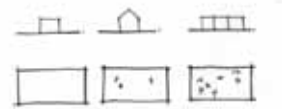
Illus: 54 Simplification of human mobility through history - Pre 20th Century (Author, 2011)



Illus: 55 Simplification of current human permanence being replaced by digital temporality and mobility - 21th Century (Author, 2011)



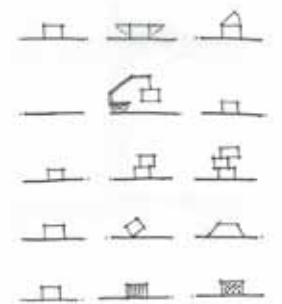
ADAPTABLE ARCHITECTURE



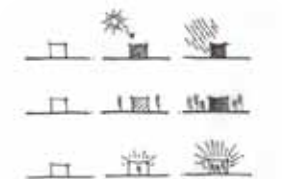
UNIVERSAL



MOVABLE ARCHITECTURE



TRANSFORMABLE



RESPONSIVE ARCHITECTURE



### 3.3.5 FLEXIBILITY

Architecturally flexibility is considered a modern issue. It became a crucial aspect when designers realized that attempting to fit a building form precisely to its function ignores the potential and inevitable growth and change that will occur over time. (Otts, 2011: 105)

A number of strategies are proposed for achieving the needed flexibility (see Illus: 56):

**ADAPTABLE ARCHITECTURE** - adaptable structures features re-positionable partitions or are changeable per user or occupant.  
*i.e. Rietveld House*

**UNIVERSAL ARCHITECTURE** - what typifies a universally flexible building is its ease of adaptation per use. These buildings are often characterized by open floor plans and typology free design to be accessed and used by all.  
*i.e. Eames House, Crown Hall by Mies Van Der Rowe.*

**MOVABLE ARCHITECTURE** - movable flexible buildings consist of re-locatable or re-positionable structures or buildings capable of being torn down and reassembled in another location.  
*i.e. Nomadic tents, Airstream Trailers.*

**CONVERTIBLE OR TRANSFORMABLE SPACE** - relies upon technology to quickly change the characteristics of space within a minimum effort. Characterized by modular design that is capable of adding or removing units or components such as hotel ballrooms that can be converted from one large space to many smaller spaces.  
*i.e. Archigram's Plug-in City, University of Phoenix Stadium.*

**RESPONSIVE SPACE**- involves architecture that moves, as it responds to changing demands.  
*i.e. Jean Neupal's Di Monte Building*

**MULTI STRATEGIC SPACE/LOOSE FIT** - mainly accommodates growth in design. Buildings are designed to be too large and grow as infill increases.

This Architecture is designed to accommodate a fixed range of current and expected future uses. It anticipates a limited number of likely changes to occur and provides for built potential for those changes to occur.

Illus: 56 Diagrams depicting elements of flexibility in Architecture and examples [Otts,2011] (Author, 2011)



### 3.3.7 STRATEGIC INTERVENTION

New structures grow and transform out of the old. Habraken states that we must learn to look at the intricate ongoing symbiosis between people and the built matter in order to understand this process of transformation. (Habraken, 2008: 45)

*"To perceive how buildings' intrinsic capacity to adapt and transform represents the key to survival, the perspective that has given rise to programmatic functionalism must be transcended."* (Habraken, 2008: 46)

In light of built environments' organic patterns of growth and change, and the transformational behavior of its forms, it appears to act very much as a living whole.

By understanding the organic nature of appropriated structure and the process by which human interaction imbues its properties on a building, one can begin to overlap certain conditions to determine niche points of engagement.

### 3.3.8 STRATEGIC DESIGN

There is a relationship between the structures we design and those we enable to emerge; this relationship is dynamic and in constant need of adjustment. (Hamdi, 2010:89)

Structure, by design, offers a network a shared context of meaning and a shared sense of purpose and justice with rules and routines that offer continuity and stability. The key questions are:

**HOW MUCH STRUCTURE WILL BE NEEDED BEFORE THE STRUCTURE ITSELF INHIBITS PERSONAL FREEDOMS, GETS IN THE WAY OF PEOPLE AND PROGRESS?**

**AT WHAT POINT DOES IT DISABLE THE NATURAL ORGANIC PROCESS OF EMERGENCE?**

Nabeel Hamdi offers that the best way to deal with the elements of change, participation or emergence, whether in standards, cultural norms or legal dictates, is incrementally and with practical example. He explains this as interventions should showcase their process within construction process. (Hamdi, 2010: 45).

The concept is one of a catalyst - of practical interventions with strategic objectives, that begin by looking for key starting points. Building of prototypes, is key to encouraging appropriation of an intervention.

### 3.3.8.1 ARCHITECTURAL INTERVENTION PROPOSAL

An intervention that actively engages with its immediate context through architectural means, in order to cultivate ownership and future growth, should respond to the existing conditions that enhance that environment:

- The intervention should employ incremental growth patterns, and grow with its context. In this way potential ownership is increased as people who develop with a building are likely to take ownership of the structure.
- The intervention will aim 'to grow' through a series of negotiated responses in different forms of temporality and permanence depending on the required need.
- The intervention itself should fluxually grow with its context, and allow for responsive flexibility from its users.

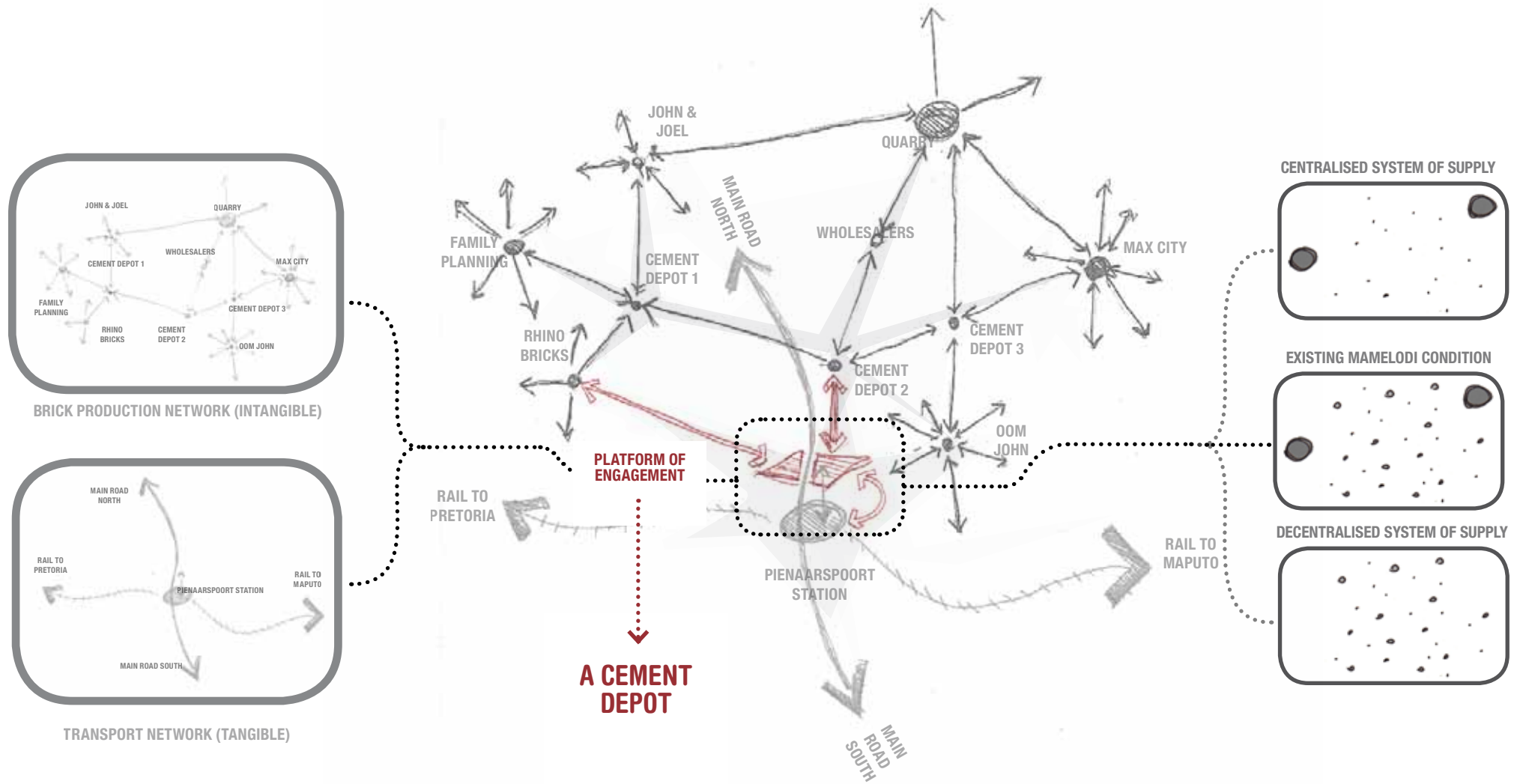
### 3.3.8.2 INTERVENTION NICHE

As stated before the intervention should not replace any functions of its host network, in this case the brickmakers, but rather seek to enhance existing processes by placement of a niche service(s) that the network cannot provide for itself:

- At present the supply of cement is from external sources at market prices based on the higher end market of large scale industry.
- There is an opportunity to provide the most basic building element for the network and its context in order to enhance a developing network for future growth.
- The connection of this function to an existing mobility node would optimize the impact of such an intervention.

### 3.3.8.3 INTERVENTION STRATEGY

By providing a platform of engagement between the intangible connections of the brick makers and sub networks around cement use and the tangible connections of the mobility route network, an intervention location can be identified. (see Illus: 57)



Illus: 57 Diagram depicting where the niche intervention lies within the tangible and intangible networks (Author, 2011)