

CHAPTER

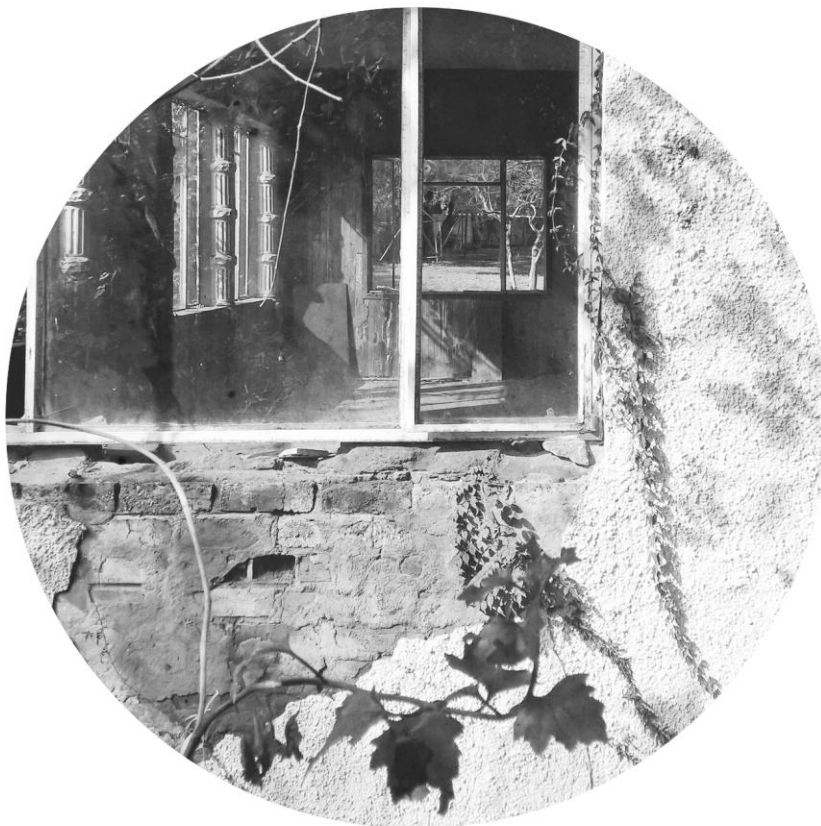
# 03

*[theoretical argument]*

urban decay as a result of neglected infrastructure

*The following chapter focuses on theoretical argument; firstly, concerned with an understanding of the reason for the decay of urban fabric; secondly, with how one is to deal with such conditions; and thirdly, contextualization of a solution.*





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*Entropy*

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## BACKGROUND AND DELIMITATIONS

To truly fathom the site and the various forces that have impacted its state of gradual decline, an attempt at a theoretical and often philosophical understanding is made in this chapter. It illuminates an awareness of the influences that initiate urban decay and provides insight into how architecture as infrastructure can lead to the regeneration of the site.

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## UNDERSTANDING THE URBAN

*[ the periphery condition ]*

The term periphery is used in conjunction with the term centre as the existence of the former implies that of the latter. These terms often appear in discourse on the urban fabric. They usually refer to a geographical positioning in space where the one exists in relation to the other. Generally, the centre is defined by the periphery. However, departing from this notion One could also say, simultaneously, the presence of the periphery implies a centre (Sennet, 2005: 1). If one were to examine the evolution of the geographical centre and the functions it historically hosted, an association and display of authority and power, where the empowered class is revealed (Sennet, 2005:1). In ancient Greece the geographical centre is defined by markets and a public space and in conjunction, a place of decision making. In the medieval period, the city's centre was occupied by a religious function normally

based around a square and city hall (Sennet, 2005:1). These historical roles all point to an empowered class functioning in the city centre. In Western cities, a desire to inhabit the centre roots from a desire for power and control. Therefore, the periphery is the essential threshold where the true nature of the centre is revealed. The centres existence through identity and function (Sennet, 2005: 2). The city of Tshwane is the administrative capital city of South Africa. As stated in the contextual analysis (Chapter 2, Figure 2.7), The primary means of inner city rejuvenation is the centralization of government departments. The Tshwane Vision for 2055 will see the accommodation of these government departments within the primary axes of the CBD. This centralization is intended to remedy the extensive and negative effects of stasis resulting from decentralization.

*"Identity centralizes; it insists on an essence, a point. It's tragedy is given in simple geometric terms. As the sphere of influence expands, the areas considered as central become larger and larger, hopelessly diluting both the strength and the authority of the core; inevitably the distance between centre and circumference increases to the breaking point. In this perspective, the recent, belated discovery of the periphery as a zone of potential value – a kind of pre-historical condition that might finally be worthy of architectural attention – is only a disguised instance of the priority and dependency of the centre: without centre, no periphery; the interest of the first presumably compensates for the emptiness of the latter. Conceptually orphaned, the condition of the periphery is made worse by the fact that its mother is still alive, stealing the show, emphasizing its offspring's inadequacies. The last vibes emanating from the exhausted centre prelude the reading of the periphery as a critical mass. Not only is the centre by definition too small to perform its assigned obligations, it is also no longer the real centre but an overblown mirage on its way to implosion; yet its illusory presence denies the rest of the city its legitimacy" (Koolhaas, 1998: 1248).*

As evidenced by the proposed Re Kgabisaspatial framework (see Figure 2.7), the Tshwane vision fails to recognize the North Eastern periphery of its CBD as a zone of potential value. Using Koolhaas' (1998: 1248) terms; the Tshwane CBD's North-Eastern periphery remains in its "orphaned" state. It continues to be labelled as a zone of which the potential values remains "a disguised instance" (Koolhaas, 1998: 1248). The oversight and neglect of the periphery may be due to firstly, the municipality's "priority and dependency of the centre" and secondly, the peripheral fabric's current state of decay.

The planned centralization of the Tshwane vision's extensive 40 year long process is robbing its urban periphery of legitimacy. In *Radical Reconstruction*, Lebbeus Woods describes the physical urban fabric of the periphery as a "wall". "These most primordial of architectural elements are necessitated by the

state of contemporary culture, which finds itself in the midst of a crisis that can be met fully at its peripheries and edges, but not at its core, even though that is where its causes and most fatal effects are found. At the core, this crisis is effectively disguised, while towards the boundaries, which are always to some degree neglected and at the limits of control from centres of authority, the disguise slips somewhat, and the crisis is revealed. The disguise is, of course, not simply an effect of the crisis, but a primary cause of it" (Woods, 1997, 13).

From Woods' theory we can thus conclude that neglect of the north eastern periphery is due to the fact that it remains excluded and therefore beyond limits of control. It is within the periphery, beyond the proposed spatial structure of the city, that the "crisis", urban decay, is revealed.

## *[ conclusion ]*

Although the roles of the centre and the periphery differ, they remain in close spatial relation to one another. It is only of recent that the terms "centralized periphery" and "marginalized centre" have come to challenge the grounded nature of the terms from its geographical place (Sennet, 2005: 2). These new terms originate from the manner in which the roles of the centre and periphery are reversed. "Centralized periphery" is used to indicate the shift in interest from the centre to the periphery.

The Urban Hub Design Toolkit states that in contrast to the heart, which is considered the most central, public, dense and intense area, the peripheral zone provides the most flexibility but also needs to be the most responsive to the surrounds (Urban Hub Design Toolkit, 2013: 13). The primary role of the periphery is to mediate between The Heart and Corridor Zones of the surrounds. The periphery is less dense than the centre and should encourage **residents** in the surrounding areas to move into the **hub** and

spaces that accommodate existing urban operators who cannot be accommodated in the more intensely developed zones (Urban Hub Design Toolkit, 2013: 13).

The intention of the Urban [infra]Structure is then to transform the North-Eastern periphery from being an environment of degeneration to one of regeneration. This is to be accomplished by means of inserting, within the heart of this degenerative environment (Brown Street), an infrastructure to highlight the importance of the urban periphery as an essential component of the urban fabric. In acknowledgment of urban theory, this infrastructure should respond to its surrounds in a way that its flexibility lends itself to a variety of uses relevant to its urban context. The idea is also that, due its intended infrastructural nature, the block of Brown Street be a sustainable component within its urban context, not longer dependent on the centre for its survival. Koolhaas suggests such a condition within his theory, "*The Generic City*".

# THE GENERIC CITY

## *[ the independent periphery ]*

The generic city is a city liberated from the captivity of the centre. It is no longer part of the destructive cycle of dependency. However, such a city is also free of its identity. Koolhaas (2005: 16) proposes the concept of the 200% city; where the city is both 100% generic and 100% specific. The generic comprises of a set of standardized components. These components are responsible for providing the city with a visual language that determines the form, orientation and setting of public architecture. The generic components that influenced the planning of Pretoria range from its natural fortifications to its cardo-decumanus (Jordaan, 1989: 26). However, Pretoria is not only comprised of the generic, it is also forms part of a '100% specific city' in its projection of its African identity.

However, due to the lack of public infrastructure, the African identity has primarily taken places within the cities periphery. Within the context of this periphery the African identity has manifested itself within the "in-between" spaces of the urban fabric. It is an informal identity in the form of informal trading and taxi ranks. More specific to the "in-between" nature of Brown Street, the manifestation of this identity has revealed the formation of informal industries based on the creative recycling of remnant scrap metal from the on-site motor vehicle industries. This 'opportunistic' identity, unique within its context, is visible in the everyday activities played out in the streets of the north eastern quadrant of the CBD.





Figure 3.1: photograph of "in-between" SPACES of Brown Street. Informal Scrap Industry (Author, 2015).

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*These most primordial of architectural elements are necessitated by the state of contemporary culture, which finds itself in the midst of a crisis that can be met fully at its peripheries and edges, but not at its core, even though that is where its causes and most fatal effects are found. At the core, this crisis is effectively disguised, while towards the boundaries, which are always to some degree neglected or at the limits of control from centers of authority, the disguise slips somewhat, and the crisis is revealed. The disguise is, of course, not simply an effect of the crisis, but a primary cause of it. Some essential realities are being masked by what has been referred to as the "self-satisfaction" of mass culture."*

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Lebbeus Woods

(Inevitable Architecture, 2012)

# UNDERSTANDING THE CONDITION

## [ *entropy* ]

*"Most architects dislike the idea of buildings' decay and work hard to avoid it by the careful selection of materials, systems, and methods of assembly that will withstand the forces of nature continually attacking them, chiefly those of weather. Nevertheless, there is a tendency to decay inherent in materials and systems themselves – an entropy – that no amount of care in design or maintenance can overcome" (Woods, 2012).*

Entropy, as used by Lebbeus Woods in understanding the principle of decay, is a term that describes the natural tendency of the universe to fall into disorder. The term was born into the world of classic thermodynamics (describing energy and its effect on matter) in 1865 by German physicist Rudolf Clausius. It was coined in 1865 by German physicist Rudolf Clausius to describe energy and its effect on matter in the field of classic thermodynamics.

Architect Erich Mendelson states "ever since science has come to realize that the two concepts of matter and energy, formerly very apart, are merely different states of the same primary element that in the order of the world nothing takes place without relativity to the cosmos without relationships to the whole" (Bullock, 1971 : 72). From this one can deduce that matter is inseparably part of energy and energy is part of matter. If matter is defined as "that which occupies space and possesses rest mass" (Oxforddictionaries.com) and architecture is defined as a profession where matter is manipulated in order to create space, then surely that which is created should be entirely

influenced by energy. This concludes that architecture is inevitably subject to entropy.

Ben-Naim (2012: 6) declares that entropy occurs on both microscopic and macroscopic scales. On a microscopic scale entropy occurs on a molecular level; energy is exchanged between atoms. On a macroscopic scale entropy can be observed through a "tangible piece of matter that you can see and work with". Similarly, disorder can be observed within the complex exchanges between objects of matter in a system. In the Built Environment, the material manifestation of architecture is vulnerable to such disorder due to its societal ideals.

In most cases the built environment exists as a strictly controlled system which, while controlled, remains in an initial state of equilibrium as it is maintained. Maintenance enables its operations to take place. These operations normally require an environment that exists almost in isolation from its natural surrounds. However, once human activity is removed, an increase of entropy is inevitable. This can most often be observed in abandoned industrial sites where components of the

system, which were once isolated, are able to become part of that system. This results in a new state of equilibrium; a state of continual transformation. In this state, natural processes create a disordered "entropic condition" in the system. What an architect here ponders is: How can we prevent this from happening? A more logical question should then be proposed: How can the architect acknowledge the condition of entropy so as to not conflict with nature but instead change and decay with nature? Smithson notes that "architects tend to be idealists, and not dialecticians". He proposes "a dialectic of entropic change" ([www.robertsmithson.com](http://www.robertsmithson.com)).

Lebbeus Woods believes that there are three ways of dealing with the entropic condition of decay. The first and most common approach is that of denial. For example, we as humans deny "our own inevitable decay and extinction [and] proceed in life as though we will live forever" (Woods, 2012). Without any promise of endurance, architects would become "paralyzed by despair" (Woods, 2012). This is probably why Lebbeus decided to never build anything; he was well aware of the inevitable fate of the building. The second approach of dealing with the entropic condition is to "embrace or at least accept decay" (Woods, 2012). However, Woods found this approach problematic, as he felt that "the evocative power of ruins" is too often exploited for ideological, religious and political purposes, but they are rarely used to advance knowledge" (Woods, 2012). The third approach

is the "acceptance of decay of buildings" (Woods, 2012). Architecture has the power to "inform our understanding of the human condition and enhance its experience" (Woods, 2012). We should therefore "include within the design a degree of complexity, even of contradiction embodied in the simultaneous processes of growth and decay in our buildings that heightens and intensifies our humanity" (Woods, 2012).

This approach to design aims to include a continued palimpsest of layers, which, instead of having a new building decay and eventually be entirely replaced, introduces the complexity of a layered perception of time. This is referred to by Woods as "inevitable architecture" (Woods, 2012).

Entropy must therefore not be considered as a destructive force. It is a progressive force that reminds us of the fact that nature cannot be overlooked or ignored. Thus, architecture that accepts the complexity of decay is able to anticipate change and transformation. It demonstrates flexibility in the design. Such a design accepts the inevitability of decay in the way its spaces come to express the layering of time. Harmony should then be found by the way in which the entropic narrative of the context is continued in the architectural design of the new. Feeding off of this narrative, in which ever form these may be, can lead to the unveiling of various potential and energies. Energies and potentials, relating to the sites origin, which seek to be reinstated.



Figure 3.2 : Photographic illustrations of decay in architecture (Author, 2015).

# UNDERSTANDING THE POSSIBILITIES

## *[ regenerative architecture ]*

\Rooted in the idea that decay is a natural phenomenon and that it therefore should inherently exist in harmony with nature and its processes, architecture should engage the natural world as a medium for and generator of the design.

Regenerative architecture stems from sustainable architecture, in that sustainability focuses on trying to make buildings "less bad". It is a standard that requires very little regarding the environment. In the world of sustainability, a built structure is celebrated if it employs any level of environmental acknowledgement.

Regenerative architecture differs distinctly from sustainable architecture. It utilizes the living and natural systems on site to become the "building blocks" for the architecture.. It has two focuses; it is an architecture that focuses on conservation and performance through a focused reduction on the environmental impacts of a building. This focus relates closely to the intentions of sustainability. However what distinguishes regenerative architecture is that it prioritizes its intentions on the treatment of the environment as an equal stakeholder in architecture. The practice of this type of architecture employs "a full understanding of natural and living systems in the design of a structure (Littman, 2009: 1). "It is an architecture that embraces the environment and uses the millions of years of engineering and evolution as the foundation for a regenerative structure" (Littman, 2009: 1). Regenerative

architecture is based on the premise that everything we build has the potential to integrate the natural world as an "equal partner in the architecture" (Littman, 2009: 2).

Architecture is defined as "the art or practice of designing and constructing buildings" (merriam-webster.com). However, this definition of architecture excludes the breadth of possibilities of the regeneration and integration which as a result limits architecture to only the design of a building (Littman, 2009: 2). Buildings always exist as part of a place, the site, however this component is neglected within the above definition. The question then becomes why we as architects tend to remove the building from its site in the defining of architecture? Littman (2009: 2) states that "the building requires the site for its existence, but we view them as separate elements. Perhaps we can expand the definition of architecture to "the art or practice of designing and constructing place, through the integration of the site and building". By including the site, in as many way as possible, is the only way in which architecture is able to be " beyond sustainable" or regenerative (Littman, 2009: 2). Applying the current definition of architecture to the design thereof, will result in a static entity devoid of

environmental integration and this leads to a linear model of consumption and waste (Figure 3.2). Removing the building from its site requires the constant input of energy and resources that end up as waste. This is a degenerative approach and with a finite amount of resources available, we can no longer afford to base the design of buildings on the linear model. It is essential to note that there is no such thing as waste in the natural world. Everything that is produced naturally gets recycled; an imperative part of the cycle of life (Littman, 2009: 3).

Architecture is therefore regenerative when its definition includes more than just the building "The architecture is the place, the site, the systems, the energy, the building, the fauna and flora, etc. It is an architecture that is purely embedded into the site. It exists as one piece, only system that co-evolves as one complete entity. Once this understanding of architecture is adopted, the opportunities for regenerative architecture become almost limitless" (Littman, 2009: 4).

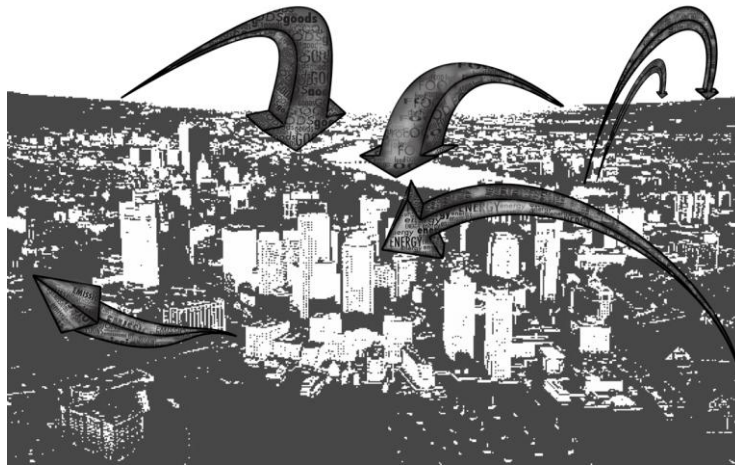


Figure A: Current model of resource and material treatment (Littman, 2009: 3).

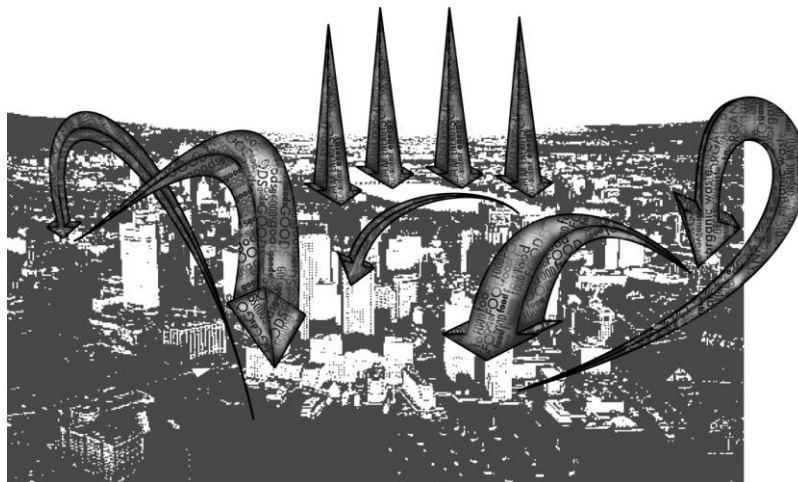


Figure 3.3: Model of regenerative urban system (Littman, 2009: 3).

# CONCLUSION

## [ *Rethinking Infrastructure* ]

As cities exponentially increase in scale and complexity, practitioners in the fields of design, specifically architecture, struggle to understand and translate the impact made by infrastructure on the urban environment. Since the discussions of "landscape urbanism" in the 1990s, architecture began looking at other disciplines to provide clues as to how to deal with the complex nature of contemporary cities: for example, the way in which the practice understands and utilizes dynamic systems to allow landscape architecture the ability to articulate ground conditions (Seewang, 2013: 1).

"For architects in particular, the definition of what might constitute an architectural approach to infrastructure remains somewhat unresolved since the effects of infrastructure on an architectural scale are almost absent from contemporary discourse and comprehension at the urban scale often focuses on the diminishing significance of form and boundaries - concrete architectural concepts - in the face of a system of networks and flows in the contemporary metropolis" (Seewang, 2013: 1).

The practice of architecture works by synthesising a disparate array of information in

order to produce a physical form that meets a range of social requirements. Dialogue between the various parties in the design process broadens the scope of questions asked and assists in determining possible solutions."The ability to convert diverse qualitative information into formal responses - to think architecturally - is a fundamental strength of architectural methodology, independent of the scale and form that the response takes" (Seewang, 2013: 1).

Infrastructure directly influences the city; moreover, it is the most immediate way to address human needs. Reyner Banham states in his 1965 essay for *Art in America* "A Home is not a House,"; likewise infrastructure acts as the agent between the social component and the architecture that it accommodates. Infrastructure should then form part of the design process, mediating between the questions and their architectural responses. Various infrastructural case studies highlighted by Seewang illustrate the mediation between natural resources to supply urban needs reframes the concept of "the city" into a complex site of social, political and economic forces. (Seewang, 2013: 2)





Figure 3.4: Skeleton Forms: Network of infrastructure projects in nineteenth-century London overlaid on top of *Fortifications of London City* (Carrelo-Mendez, 2009: 3).

