

03

CHAPTER THREE

CONTEXT: FIRST READING

INFRASTRUCTURE AT THE
SCALE OF THE CITY

Introduction

Investigating Infrastructure through Boundary and Symbolism

3.1

Introduction

Establishing an architectural approach to infrastructure is challenging, as at the scale of architecture, the effects of infrastructure are almost absent in contemporary discourse, and at the scale of the city, the extent of its significance appears to be declining with the increased implementation of isolated systems and networks, presenting the nature of infrastructure in the present condition of our cities as static and stable, an ubiquitous utilitarian presence, dominated by economics and efficiency (Seewang 2013).

An architectural lens for investigating an alternative method for the development of existing infrastructure in our cities would be beneficial, as an architectural approach synthesises an array of information, positive opportunities and constraints in design criteria, and reimagines them into positive attributes of built form. A fundamental strength of an architectural methodology for this approach is the ability to transform qualitative information into a formal response, creating an approach that integrates the built form of the surrounding urban landscape, the social networks and economic opportunities, as well as the ecological potential and constraints, in order to fully comprehend the spatial consequences produced by the implementation of public infrastructure.

The contextual investigation therefore considers infrastructural development in three separate chapters (Chapter 4:Infrastructure at the Scale of the City, Chapter 5:Infrastructure at the Scale of the Apies River, and Chapter 6:Infrastructure at the Scale of the Site) as layered readings building a collective image of the project's contextual conditions.

In Chapter 4_Infrastructure at the Scale of the City, the first reading proposes an investigation of infrastructure through an understanding of its boundaries of influence and significance, in order to create a collective understanding of the image of the city as a complex site of social, political and economic forces that facilitate natural resources in order to supply urban needs.

The architectural parameters for the first reading are inspired by the work published by S. Carlisle and N. Pevzner in Scenario Journal 03, “Introduction: Rethinking Infrastructure” (2013). This publication discusses a collection of investigations regarding infrastructure at various scales and from a range of disciplinary perspectives. It builds on ideas from projects developed in accordance with Kevin Lynch’s symbolic characteristics of identity in cities and neighbourhoods; and on O.M. Ungers’ and Rem Koolhaas’ Green Archipelago approach for redesigning urban island boundaries at their 1977 Summer Academy; that specifically focussed on rescribing and reinventing existing city boundaries and infrastructure towards a collection of decentralised centres. As opposed to the focus on designing new cities with singular central cores.

The second reading of the Apies River as important infrastructural entity within the city of Pretoria is further investigated in Chapter 5_Infrastructure at the Scale of the Apies River, in order to propose a vision for the future extended boundary of effects within the city context. This investigation identifies the historical and formal particularities of the Apies River infrastructure through defining its present condition and constituents within the city, and illustrating the historic and current symbolic role of these as actors that respond to and transform the development of the ecological corridor.

At the scale of the site and surrounding precinct, the third reading, Chapter 6_Infrastructure at the Scale of the Site, extracts and investigates the existing infrastructure as a series of isolated networks of ecological, water, transport and social infrastructure, based on the ecosystemic masterplanning principles as set out by architect Ken Yeang in his recently published book, Ecomasterplanning (Yeang 2009:16). This ecosystemic approach proposes an alternative understanding of sustainable development as a dynamic assembly that integrates all four infrastructural categories, in order to provide an informed speculation and alternative solution beyond the current paradigm of static, ad hoc implementation of infrastructure that addresses present conditions without any

3.2

Investigating Infrastructure through Boundary and Symbolism:
The city as a complex collection of forces

The concepts of boundary and symbolism are central to architectural discourse. Boundary is typically understood to be the line that indicates the meeting point of the building and the surrounding context, such as at the sidewalk, street or adjacent site, whereas symbolism is understood through the communication of the building language and presence through massing, form, scale and tectonic resolution, all contributing to the architectural identity (Seewang 2013).

The first reading analyses the collective image of the city through the boundary of influence and the symbolism of its consecutive infrastructural developments. The application of these parameters reveals the agency of specific projects in the broader city, and the cultural context that allows for a reinvention of architecture and urban space that are integrally produced through infrastructural development, capitalising on political, social and economic potential – as alternative to the present condition of architecture and public space created as an independent layer upon a neutral base of uniformly distributed service networks.

An example of political, social and economic factors influencing the implementation of infrastructure and architecture, and thus reflecting a particular urban culture could be read in the grid, structure, grain, form and symbolism of significant streets in the city of Pretoria, such as the transformation and significance of W.F. Nkomo Street running from Pretoria West, extending into Helen Joseph Street in the city centre and becoming Stanza Bopape Street that extends to the eastern residential suburbs – the extent of former Church Street.

An apparent change in grid and development grain from the city centre represents the cultural identity and activities as displaying a large-scale commercial and bureaucratic condition to its northern boundary, with Marabastad situated north-west of the city centre as having a fine-grained, more informal economic condition, stimulated by active street conditions as opposed to internalised activities.

The symbolic significance of streets therefore gives order to and represent the culture of a city beyond their primary use as transportation and services infrastructure.

Both quantitative and qualitative research were used to create a series of composite maps of the city that represent a concurrent relationship between infrastructural projects and the development of the city over time. This series of maps illustrates the transformation of Pretoria's early infrastructural projects, that acknowledged and were evidently connected to the capacity of its natural resources, into the present, isolated networks controlled by a modern industrial capital. The architectural nature of this investigation allows for an understanding of the consequential transformation of contemporary cities and simultaneously inspires a response that remains architectural in nature, while addressing broader spatial concerns at a city scale (Seewang 2013).

Map 1: 1600s – 1825

The natural infrastructure of the early Pretoria region

The natural topography of Pretoria presented a protected terrain between the surrounding mountain ranges and koppies, with accessible water as source of life for the various tribes occupying the Pretoria region. An Ndebele tribe led by King Mzilikazi settled in the region by establishing two military kraals along the Apies River (Huffman 2010)

Map 2: 1837 – 1857

The establishment of the town of Pretoria

The first farmland titles:

In December 1837, General Hendrik Potgieter successfully evicted the Ndebele tribes from the region and the first White inhabitants, Lucas and Gert Bronkhorst, registered the farms Groenkloof and Elandspoort in Pretoria. Groenkloof was situated in the Fountains Valley area, while Elandspoort included an extensive area of land with its southern boundary above Fountains Valley, extending to Daspoortrand in the north and from the west of Pretoria through to its eastern boundary where Hatfield is presently located. In 1853, Marthinus Wessel Pretorius, son of Andries Pretorius, purchased Elandspoort and Koedoespoort, and declared it to be the town of Pretoria (South Africa History Online 2015).

The establishment of the Church Square Kerkplaats and grid layout at the confluence of the Apies River and openings (poorte) in the surrounding mountain ranges:

The city of Pretoria was founded by President M.W. Pretorius who commissioned the first public square for church and market purposes, known as Kerkplaats, or “Church Place”. Church Square was situated on the crossing of Church and Market Streets as central symbol of the establishment of the town. The history of Church Street predates the establishment of the town. It served as trade route between Delagoa Bay and Potchefstroom, at the confluence of the Apies River and Walker Spruit. The consequential grid development of the town was confined by two natural watercourses, namely the Apies River and Steenhoven Spruit to the east and west respectively, as well as the openings (poorte) in the northern and southern bounding mountain ranges as access points to the city centre (South Africa History Online 2015).

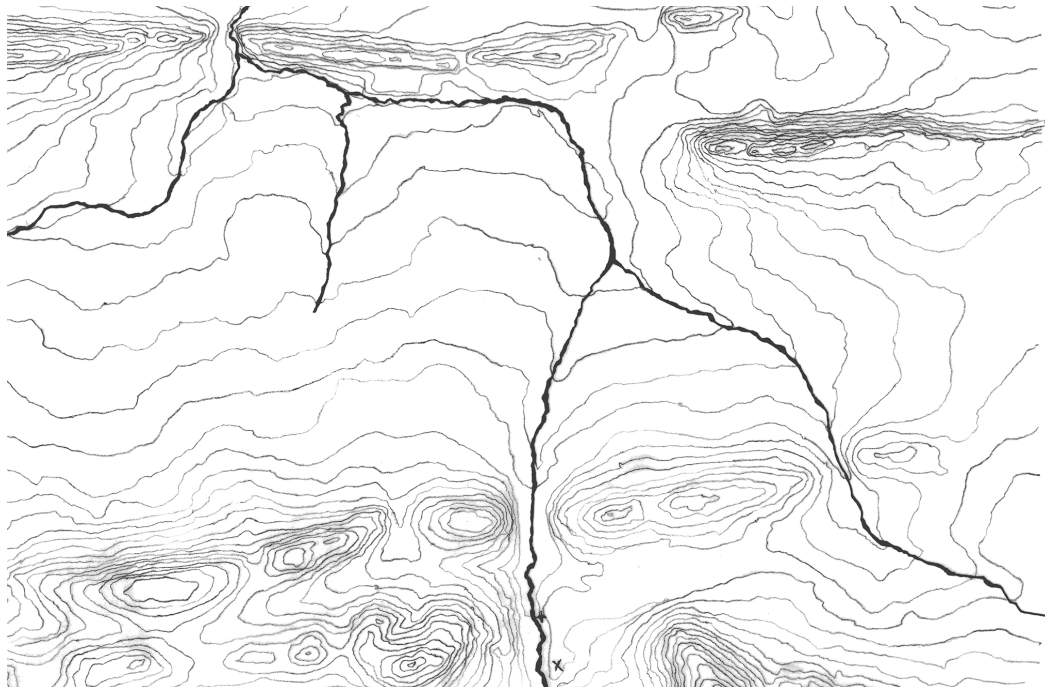


Figure 3.1: Map 1 - The natural infrastructure of the early Pretoria region. (Author 2015)

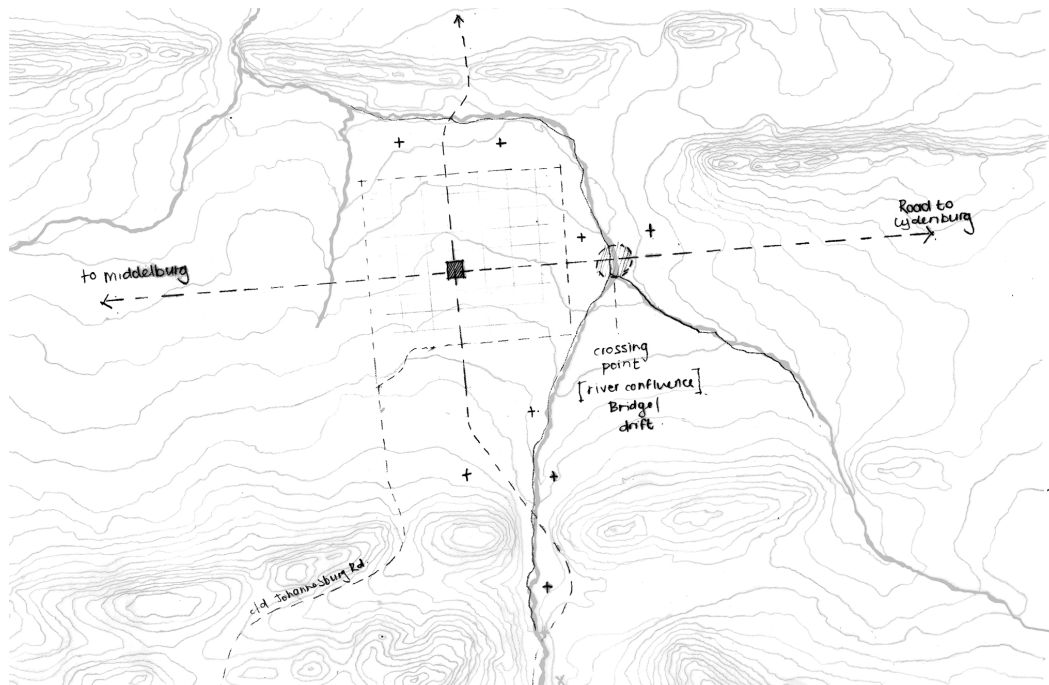


Figure 3.2: Map 2 - The establishment of the town of Pretoria. (Author 2015)

Map 3: 1880 – 1910

The water reticulation network, canalisation of the Apies River and construction of the Lion Bridge, allowing further development of the city's first suburbs and reinforcing the significance of the Church Street axis.

In 1890 the first water infrastructure was implemented, comprising a 12 inch (300 mm) diameter aqueduct conveying water from the Fountains Valley into the centre of the town, as well as a cast-iron reticulation network serving the extents of Pretoria Central and Trevenna.

At the crossing of Church Street and the Apies River, the construction of Lion Bridge (Leebrug) was completed in 1894. Designed by S.W. Wierda, first engineer and architect to the South African Republic, the Lion Bridge as remarkable sandstone structure, elaborately ornamented with symbolic bronze lion figures on pedestals, reinforced the significance of Church Street as main axis between the town centre and surrounding suburbs.

The canalisation of the Apies River soon commenced and took place from 1909 to 1930, after a heavy rainstorm resulted in flooding, damage of property and loss of life along the river. Development pressures and the river's relegation to human engineering through canalisation and bridge construction transformed it from a natural threshold with significant ecological potential into a concrete, restricted, linear entity. The control of this natural entity, however, allowed further urbanisation of the surrounding suburbs Arcadia, established in 1889, and Sunnyside, established in 1890, to occur (South Africa History Online 2015).



Figure 3.3: Map 3 - The The water reticulation network. (Author 2015)

Map 4: 1892 – 1910

Electricity and transportation infrastructure led to the expansion of the boundaries of urbanisation and reinforced the importance of the Church Street axis.

Electricity infrastructure:

The first electricity infrastructure was implemented in Pretoria during 1892, with the power station erected on Frances Baard (formerly Schoeman) Street. The introduction of electricity enabled a range of consequential infrastructural developments that expedited urbanisation, such as the electric tram system and various industrial opportunities leading to the establishment of Pretoria West.

Transportation infrastructure:

In 1892 the first railway station was erected in Pretoria, with the official opening of the Delagoa Bay railway line in 1895. Electric trams were soon introduced as public transportation between the city centre and adjacent suburbs of Arcadia and Sunnyside, with the Municipal Tram Sheds constructed on the corner of Lilian Ngoyi (formerly Van der Walt) and Frances Baard (formerly Schoeman) Streets in 1912, some of the structures of which are still maintained and occupied by shops today.

Water infrastructure – the sewerage system:

In 1903 the first formal sewerage system was implemented in Pretoria, following the deterioration of hygiene in the town due to poor maintenance and inadequate water and sewage practices. A report in *Die Volksstem* of 8 August 1877 stated: “The homesteads in Pretoria, how fearfully the smell; there’s fever in the furrow, there’s sewage in the well”.

Reinforcing the symbolic significance of the Church Street axis through political significance:

Pretoria was assigned to become the administrative capital for the new government, and in 1909 Herbert Baker was appointed to design the building that symbolises the Union of South Africa on Meintjieskop. The boundary of the site is located on the significant Church Street axis. The cornerstone was laid in November 1910 and construction of the Union Buildings was completed in 1913.

The following suburbs were established shortly after the implementation of these infrastructural developments, consequently furthering the development of the city.

- 1892 Pretoria West
- 1896 Mayville, Eloffsdal and Villieria
- 1897 Hermanstad
- 1898 Roseville and New Muckleneuk
- 1902 Brooklyn, Gezina, Wonderboom South, Rietfontein, Parktown, Mountain View and Claremont
- 1903 Pretoria Gardens, Daspoort, Rietondale and Waterkloof
- 1905 Lady Selbourne, Hatfield and Booyens

(South Africa History Online 2015)



Figure 3.4: Map 4 - Electricity and transportation infrastructure. (Author 2015)

Map 5: 1910 – 1968

Fragmented urban development due to the implementation of vehicular transportation infrastructure as isolated network of control and convenience, upon (instead of integrated with) other layers of infrastructural development.

Major Vehicle Transportation network:

With the last tram leaving Church Square in 1939 and the introduction of petrol busses to the city in 1968, the focus of transportation infrastructure shifted to larger projects of vehicular networks around the city, such as Nelson Mandela Drive, a 10 lane motorway at its widest, hindering pedestrian ease of access and dissecting the city into fragmented public realms. One of the unrealised proposals includes the 1967 Ringroad Highway proposed to be positioned around the city centre, with the intention of establishing a total of 13 roads in order to provide additional carrying capacity in the north-south direction.

The development of an extensive vehicular network drastically increased Urbanisation to the outer suburbs listed below:

1914	Capital Park
1928	Colbyn
1934	Menlo Park
1939	Waterkloof Ridge

Pretoria as Apartheid city

Infrastructure as control and for exploitation of political, social and economic agendas

The relocation and establishment of additional residential areas, removed from the city centre and without access to services and opportunities, largely dominated the spatial agenda of Pretoria as apartheid city. The following significant developments occurred.

- In 1923 the first pass law was implemented in South Africa as a measure of regulating the access of black Africans to white urban areas.
- Atteridgeville was established in 1939 with the first 50 families relocated from Marabastad in 1940.
- The township of Mamelodi was established in 1951 on the north-east outskirts of Pretoria.
- In 1960, Laudium was established as a residential township for Indians, and in 1962 Eersterust was laid out 15km from the city centre as an area allocated to coloured inhabitants.

(South Africa History Online 2015)

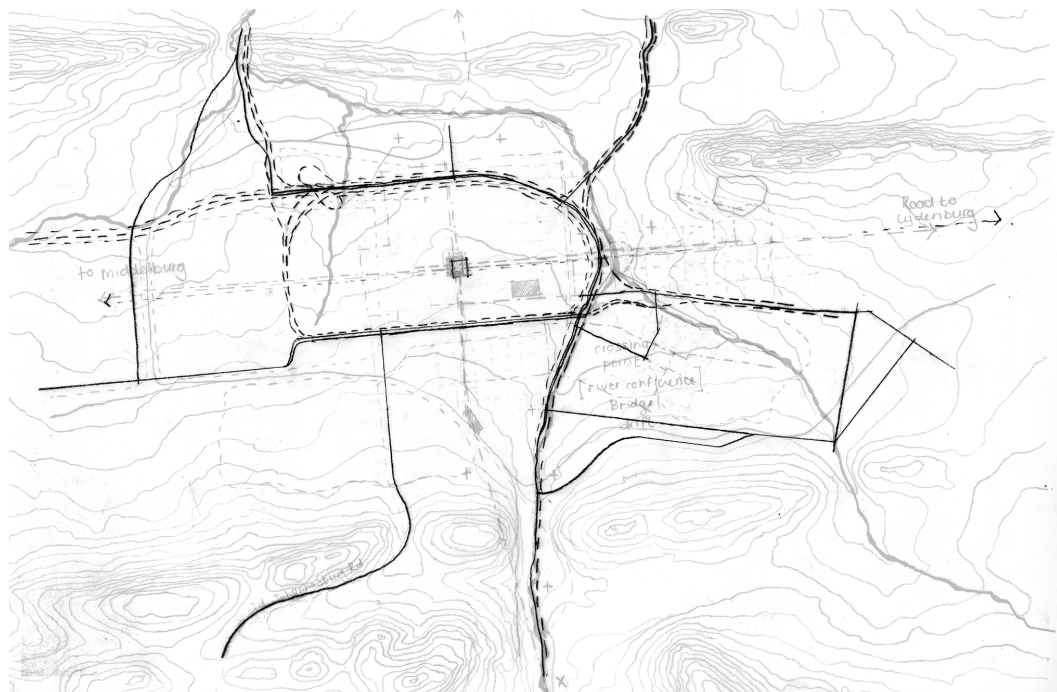


Figure 3.5: Map 5 - Fragmented urban development due to the implementation of vehicular transportation infrastructure. (Author 2015)

Pretoria as democratic city

The pedestrianisation of Church Street, implemented during 1996, extends from Bosman Street west of Church Square to Lilian Ngoyi (formerly Van der Walt) Street. The intention of this project was to improve pedestrian and public life within the city while diversifying social, cultural and economic opportunities as a catalyst to encourage further developments.

Freedom Park celebrated the democracy and freedom of the people of South Africa with the manifestation of this significant memorial in 2007. A reconciliation road was constructed in 2011, physically and symbolically linking Freedom Park to the Voortrekker Monument.

The start of a new era of public transportation commenced with the operation of the first Gautrain route from Rosebank to Pretoria and Hatfield in 2011.

Map 6: Synthesis and Extraction of potentials

Two resilient and symbolically significant entities are identified and investigated further

The Church Street axis as Ceremonial Boulevard:

Throughout the transformation of the city, the historical and present significance of Church Street as primary axis through the city is reinforced by the extent, trajectory and symbolism of the various infrastructural projects implemented and investigated in the series of maps discussed, as well as by various intangible significant historical events, ceremonies and marches.

The Apies River Corridor and ecological network:

The Apies River as natural entity dominated by the development of modernisation and urbanisation played an important role in the establishment and development of Pretoria, and offers a broad spectrum of potentials currently underutilised and to be extracted and reimagined to the benefit of the public realm.

(South Africa History Online 2015)



Figure 3.6: Map 6 - Two resilient and symbolically significant entities are identified and investigated further. (Author 2015)

