200 000 BCE
FIRST STONE AGE PEOPLE PRESENT IN THE TSWHANE REGION.

1600's
THE MAGALIESBERG VALLEY WAS OCCUPIED BY THE SOUTHERN NDEBELE AND TSWANA SPEAKING PEOPLE WHO OCCUPIED THE RIVER VALLEY AND LATER BECAME PRETORIA CITY.

1650
THE KWENA TRIBE ARRIVED IN THE VALLEY. A KWENA CHIEF, MMATAU NAMED THE KWASHANE OR CASHAN MOUNTAINS WHICH WOULD LATER BE NAMED. THE MAGALIESBERG AFTER CHIEF MOHALE.

1800
eKWENA MMATAU CONSTRUCTED EXTENSIVE STONE WALLED SETTLEMENTS ALL ALONG THE SOUTHERN SLOPES OF THE MAGALIESBERG.

1840
THE FIRST AFRIKAANS SETTLERS ARRIVED IN THE REGION AND THE AREA WAS TO THEM AS A GOVERNMENT SETTLEMENT.

1860
ESTABLISHMENT OF PRETORIA'S WATER FURROW SYSTEM.

1899
ESTABLISHMENT OF PRETORIA'S BOTANICAL GARDENS ON THE OLD ESTATE OF RUS DE URBE.

1906
FIRST JACARANDAS PLANTED ALONG PRETORIA'S STREETS. CELLIERS BROUGHT SEEDS FROM BRAZIL IN 1898 AND PLANTED THEM IN THEIR FRONT YARD IN SUNNYSIDE. HENCE THE JACARANDA CITY.

1930
THE APIES RIVER WAS CHANNELISED IN RESPONSE TO DANGEROUS FLOODING WHICH KILLED MANY AND DAMAGED PROPERTY.

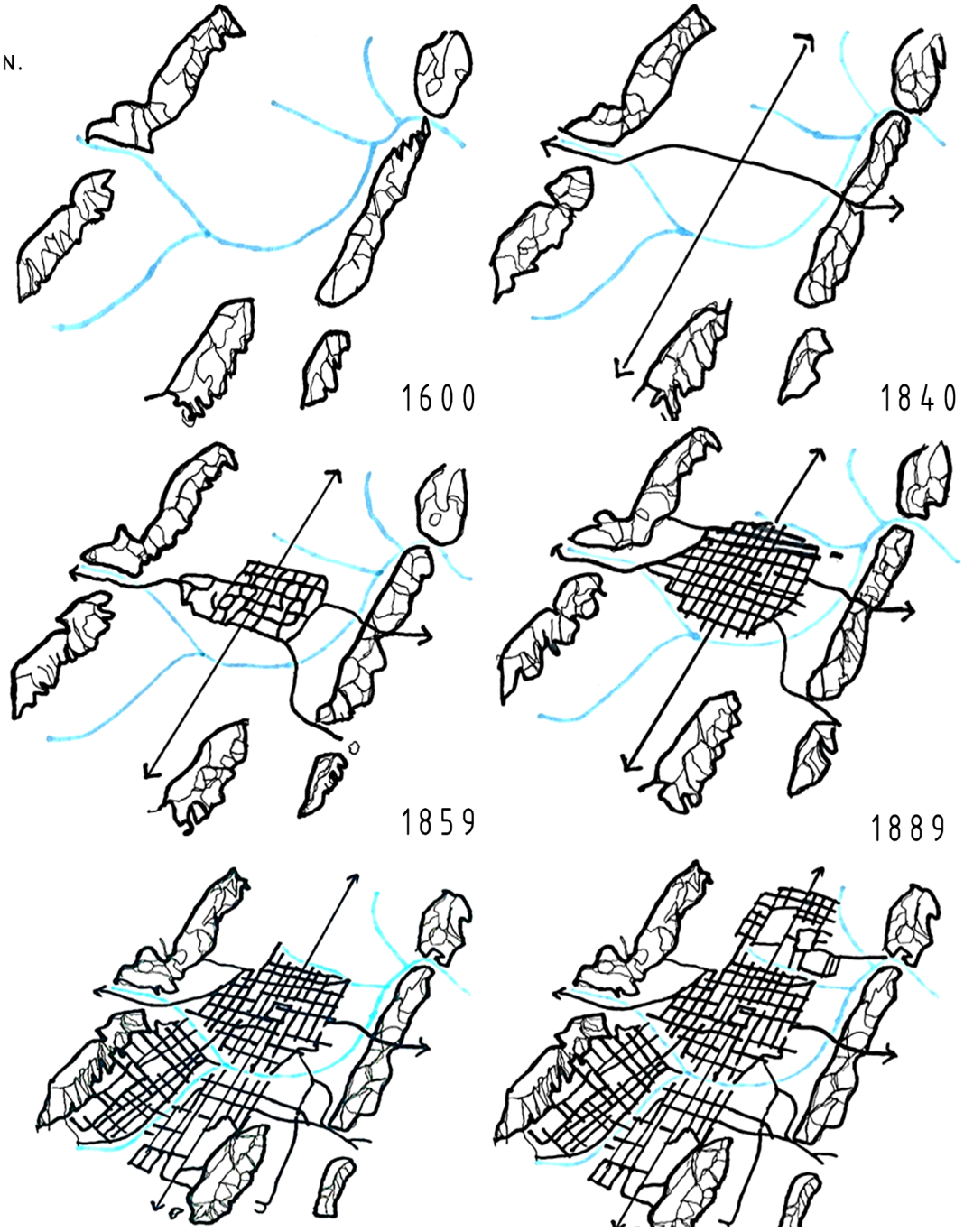


Figure 2.16. Pretoria's Development over time. Van Der Waal Collection, 1999.

1890

FOUNTAINS VALLEY WAS THE ONLY WATER SOURCE FOR PRETORIA'S INHABITANTS. THE WATER SCHEME WAS COMPLETED IN 1890, A 300 MM DIA. AQUEDUCT LAID FROM THE FOUNTAINS VALLEY INTO TOWN AND A CAST IRON PIPE NETWORK TO PRETORIA CENTRAL AND TREVENNA.

1907

IT IS INTERESTING TO NOTE THAT PURIFICATION WORKS (FOR SEWAGE IN PRETORIA) WERE BUILT DURING AND JUST AFTER THE ANGLO-BOER WAR AT VARIOUS MILITARY CAMPS, INCLUDING VOORTREKKERHOOGTE, THEN KNOWN AS ROBERTS HEIGHTS. TWO BIOLOGICAL FITERS CONSTRUCTED THERE IN 1907 ARE STILL FUNCTIONING SATISFACTORILY.

1910

THE OLDEST MAIN SEWER IN PRETORIA IS PROBABLY THE EGG SHAPED SEWER OF 21 INCHES X 15 INCHES (533 MM X 381 MM) WHICH WAS CONSTRUCTED ALONGSIDE THE STEENOVENSPRUIT BEFORE 1910.

1923

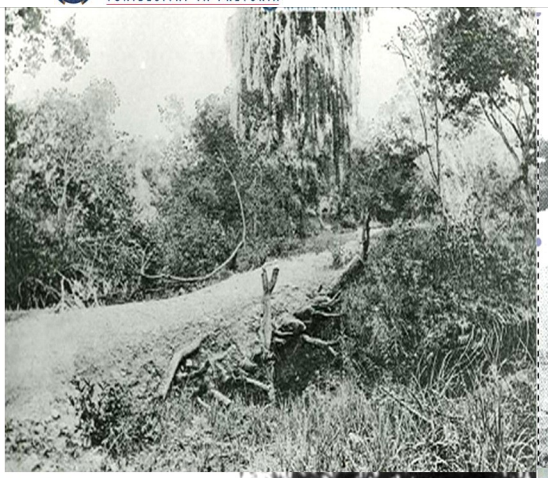
PRETORIA WATER SUPPLY:THE DAILY WATER CONSUMPTION WAS 4.47 MILLION GALLONS (21.48 ML) WHICH WAS THE SUPPLY CAPACITY OF THE FOUNTAINS IN 1923.

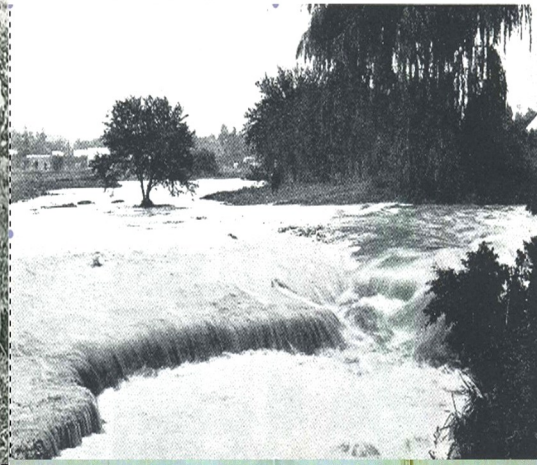
1986

PRETORIA WATER SUPPLY: DUE TO THE CONTINUAL DEBILITATION OF THE WATER QUALITY FROM THE RIETVLEI DAM, IT WAS DECIDED TO APPOINT CONSULTING ENGINEERS TO INVESTIAGTED THE CAUSES AND SOLUTIONS IN COOPERATION WITH THE NATIONAL INSTITUTE OF WATER RESEARCH AT THE CSIR. THIS LED TO THE UPGRADING OF THE PURIFICATION WORKS THAT COMMENCED IN 1986.

1996

PRETORIA OPERATES FOUR WASTEWATER TREATMENT PLANTS, NAMELY DASPOORT (45 ML/DAY), BAVIAANSPOORT (36 ML/DAY), ZEEKOEGAT (30 ML/DAY) AND ROOIWAL (210 ML/DAY).





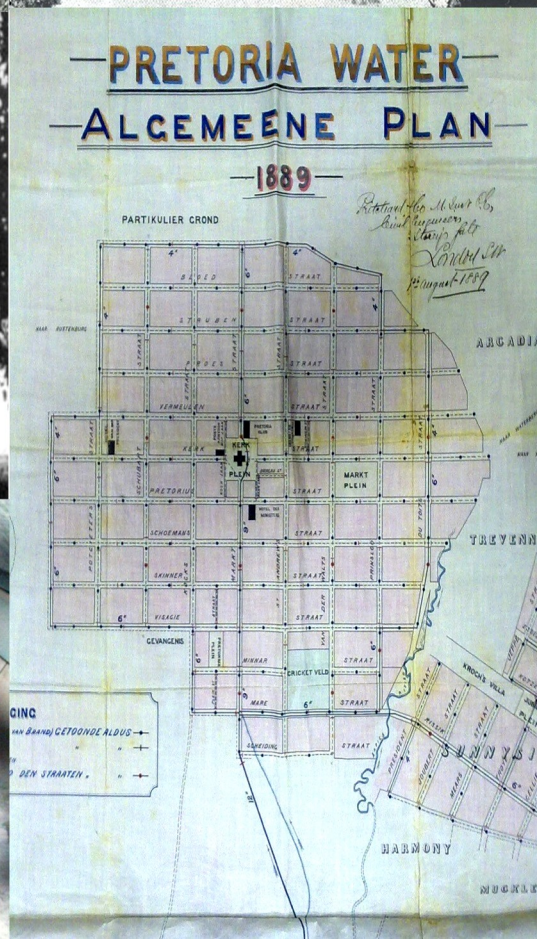


Figure 2.17. Pretoria's Development over time. Van Der Waal Collection, 1999.

2.2 URBAN VISION POTENTIAL

2.2.1 INTRODUCTION

Erasmus et al. (2016) unpacked potentials according to the preceding mapped layers and was considered against the background of historical periods over time (see Figure 2.18). The potential strategies would attempt to unlock the natural characteristics of the river and its adjacent site in an attempt to address both the macro (urban) and micro (architectural) scale of the Apies River.

2.2.2 HISTORY

Pretoria was founded on an agricultural flood plain and was later envisioned as the Transvaal's administrative capital (see Figure 2.16). According to Kovacs (1978:31), flooding became an increasingly significant problem as the city developed. These changes occurred as a result of channelisation. As previously discussed (see Figure 2.15) this created large open, non-space which can be seen as a mono-functional scar running throughout the city (see Figure 2.14).

2.2.3 ECOLOGICAL

The urban vision proposes to reduce the artificial disturbance relating to the Apies River in order to restore and maintain the integrity of the river ecosystem (see Figure 2.18). A restoration of the river's ecology by creating integrated retention ponds would replenish the low water channel to ensure the river's self-purifying capacity. A river's capacity to self-purify through the implementation of retention ponds i s a concept explained by Grant (2016:116). The ecological habitats of both plant and animal species would develop from the proposed water-friendly features (i.e. bioremediation ponds or constructed wetlands) and green spaces (see Figure 2.19). These features and spaces would also be available to the public.

2.2.4 MOVEMENT

Certain spaces identified next to the river limit accessibility to the river (see Figure 2.20). The framework vision proposal allocates the addition of more river-crossing spaces and if necessary the provision for a lane for public transport by the use of existing car lanes. These changes would allow for the development of public spaces along the river and would accommodate wider sidewalks. Such changes would also make provision for bike lanes, bus and taxi stops.

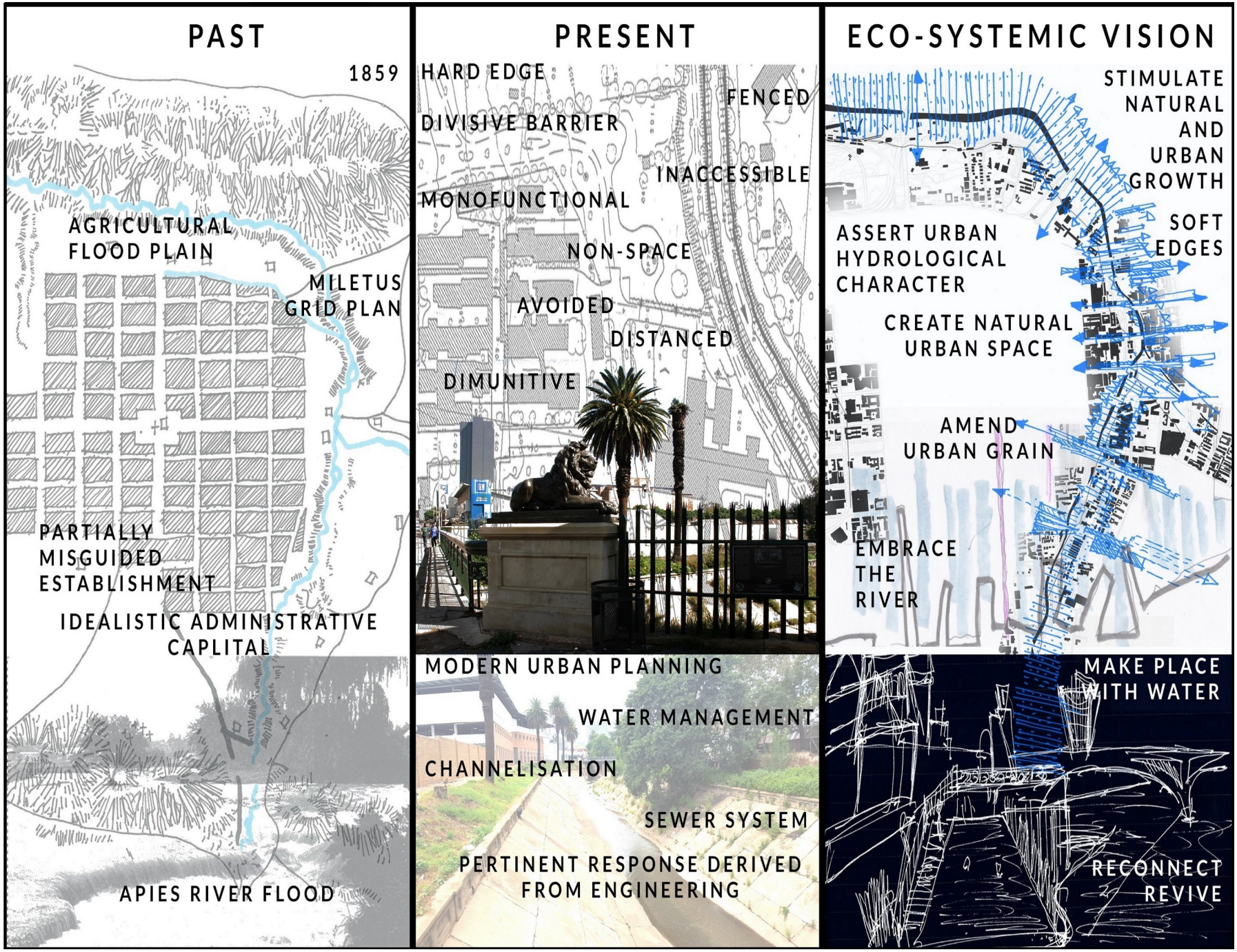


Figure 2.18. Water Group Urban Vision: Eco-systemic narrative over time. Erasmus et. al., 2016.

Figure 2.19. Water Group Urban Vision: Eco-systemic narrative over time II. Erasmus et. al., 2016.

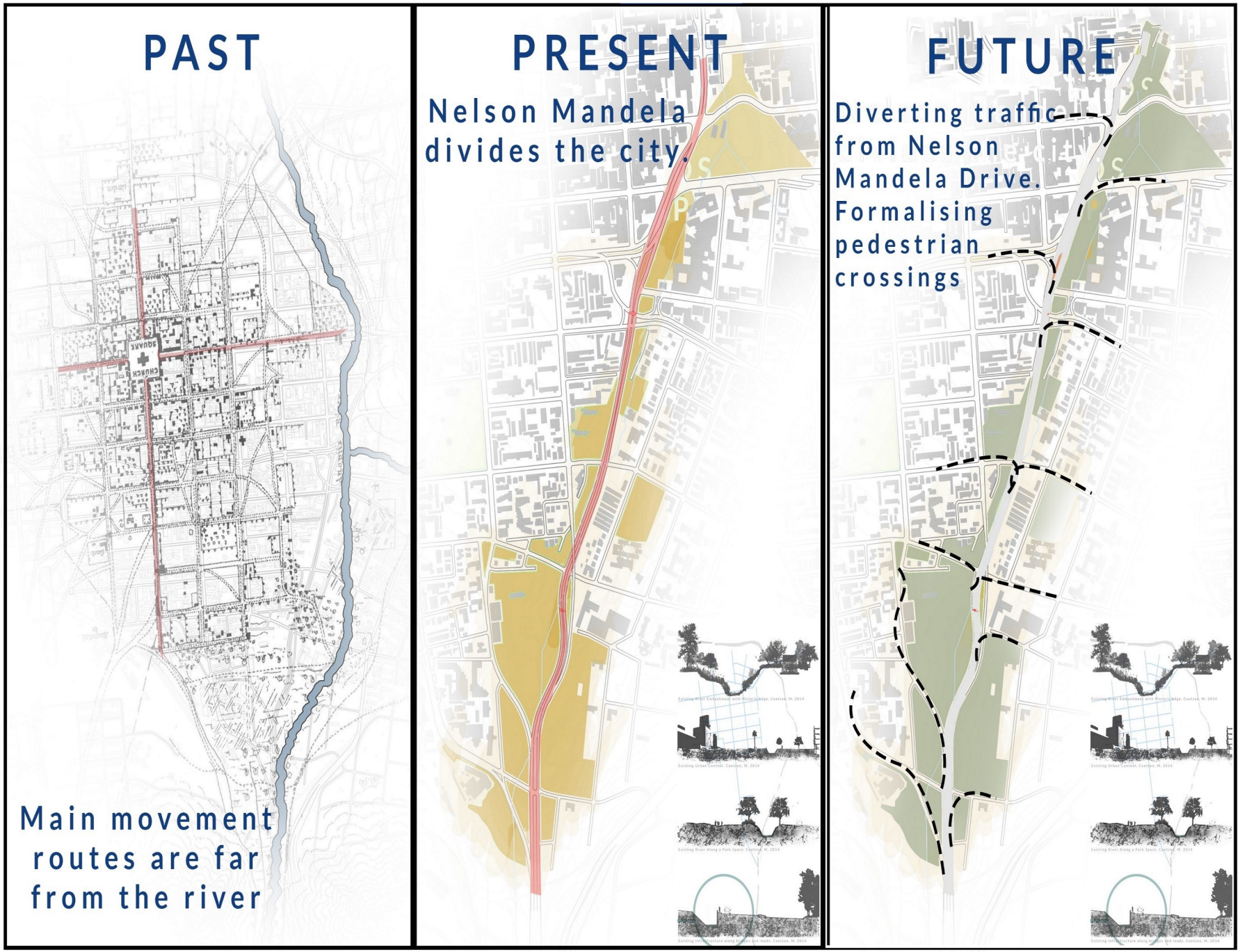


Figure 2.20. Water Group Urban Vision: Urban movement layer over time. Erasmus et. al., 2016.

2.2 URBAN VISION POTENTIAL

2.2.5 GREEN SPACE

Green spaces were identified for their existing ecological potential (see Figure 2.6). These areas showed certain zones where ecological aspects, such as flora, fauna, and birdlife, were visibly present and could be well integrated with the surrounding urban fabric. Examples of such zones are natural zones such as the Groenkloof Nature Reserve, Berea Park, the Pretoria City Zoo and open spaces around the Prinshof Medical District.

2.2.6 INTERFACE

There is potential to blur the divide between the natural and man-made environment (see Figure 2.21), particularly in areas where both elements are present and where the intervention could be applied. This potential is seen in conjunction with the river system. Potential for interfaces to be explored could be considered at identified anchored points (see Figure 2.24). These river spaces merge with urban spaces were identified where significant activities in terms of economic and social exchange could manifest (see Figure 2.22 and Figure 2.23).

2.2.7 ANCHOR POINTS

The urban vision proposes anchor points which would connect spatially to the river channel (see Figure 2.24). These anchor points would consist of new, mixed-use facilities aimed at densifying and connecting the urban fabric along the river channel.

2.2.8 CONCLUSION

Urban edge conditions (see Figure 2.21) were considered important to the proposed intervention and were identified alongside the river where hard, natural, or building edges were present. The proposal focuses on the river's potential to create meaning in a future scenario with regard to the urban vision outlined above. Figure 2.25 summarises the layers derived from the urban vision as a layered framework with regard to the Apies River. 'Blue zones' as per this layered framework were identified as having the most potential for interaction with the Apies River. Such areas would for example, allow site potential to be explored further regarding the allocation of constructed wetlands or allowing the river to flood certain parts of its banks. This could happen within controlled allocated spaces, thereby avoiding flooding of the surrounding areas.

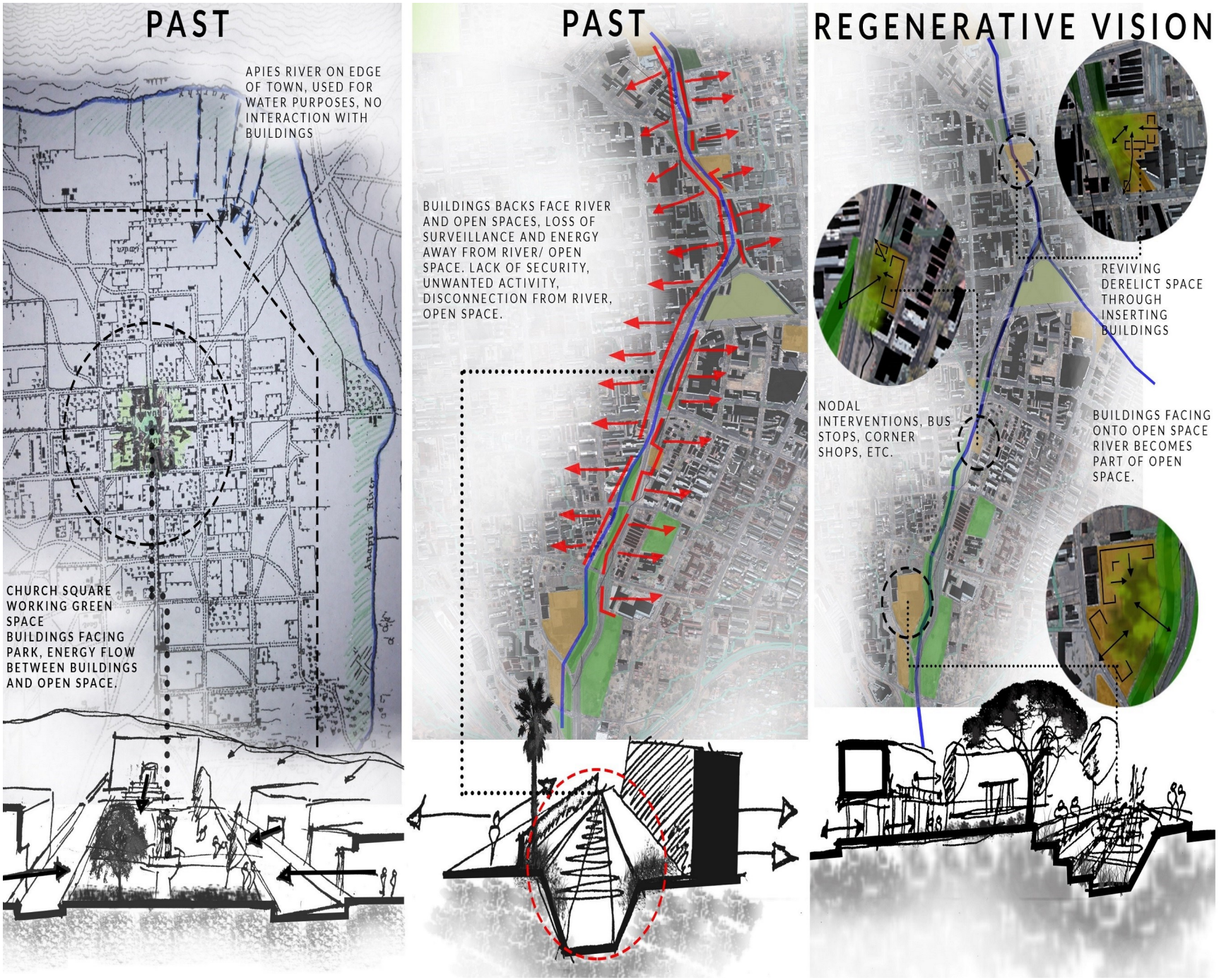


Figure 2.21. Water Group Urban Vision: Green Space over time. Erasmus et. al., 2016.

Figure 2.22. Water Group Urban Vision: River rituals over time. Erasmus et. al., 2016.

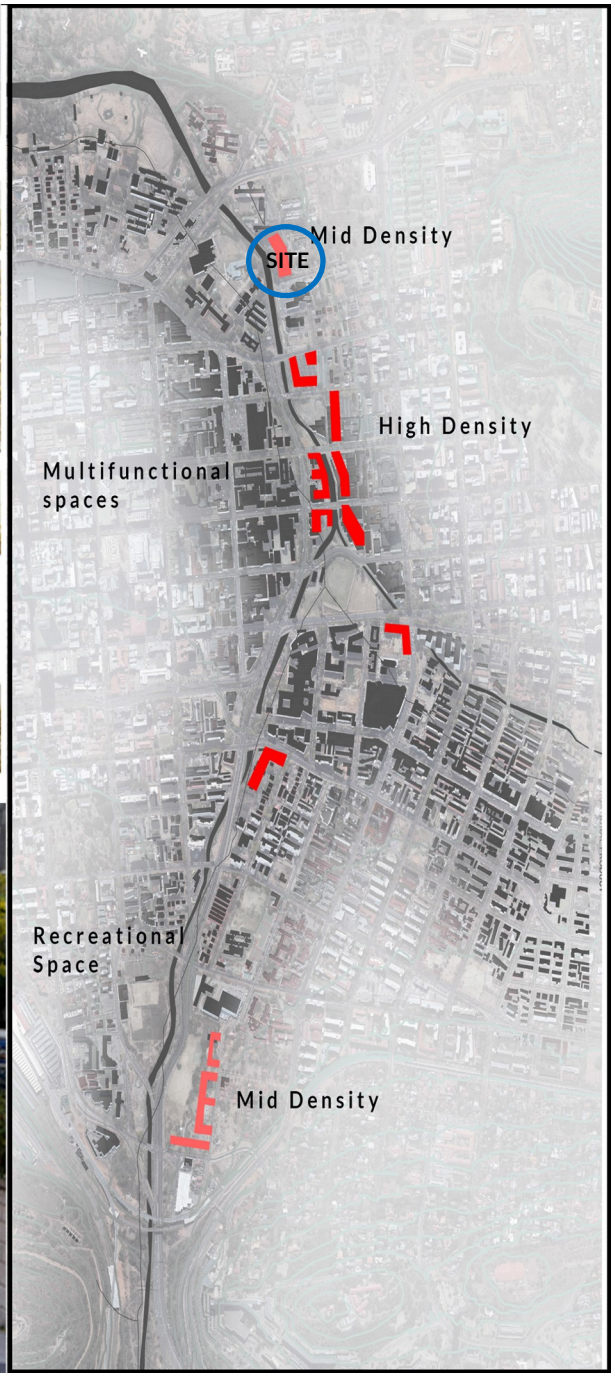


Figure 2.23. Water Group Urban Vision: Urban Rivers Interface. Erasmus et. al., 2016.

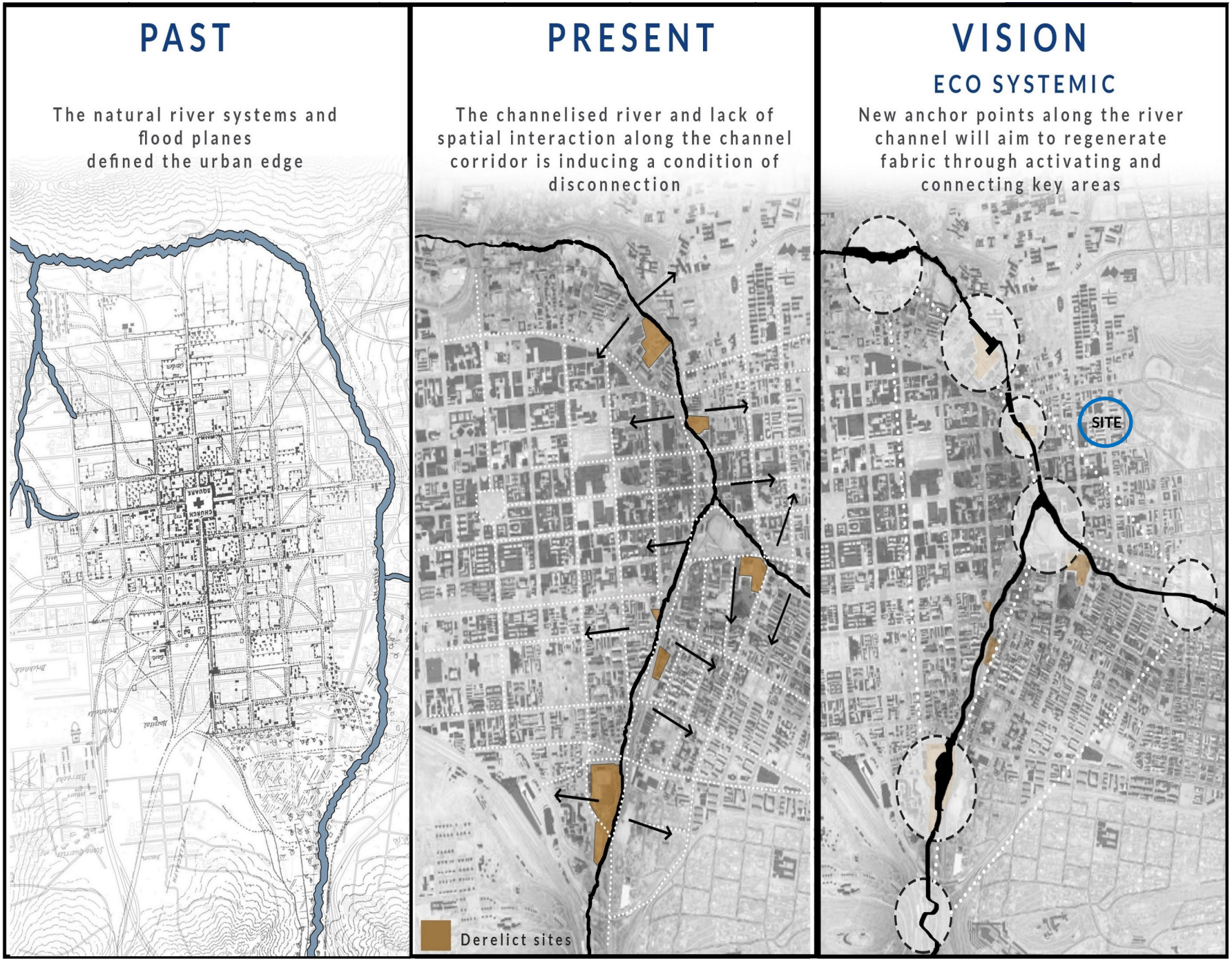


Figure 2.24. Water Group Urban Vision: Anchor points strategy. Erasmus et. al., 2016.

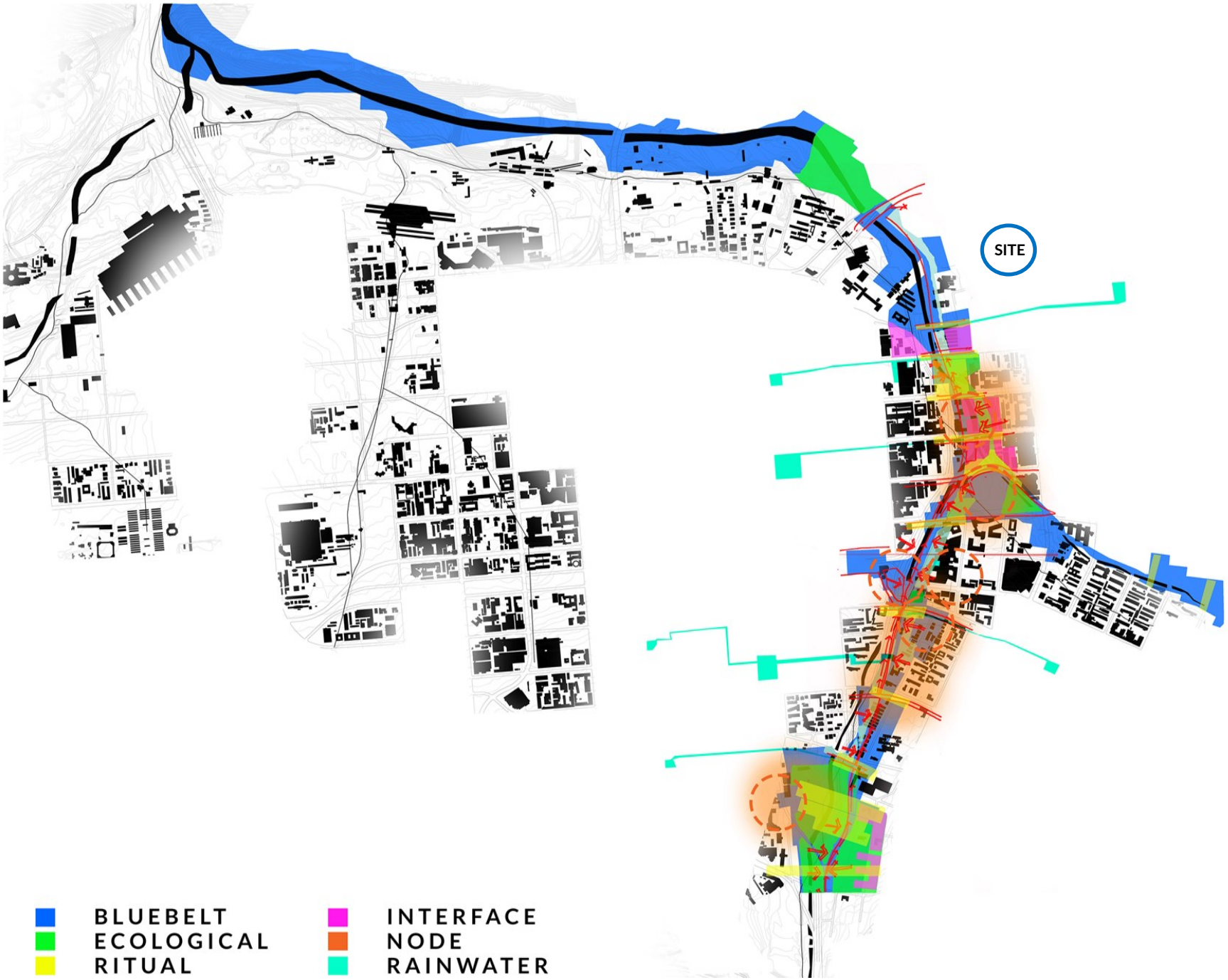


Figure 2.25. Water Group Urban Vision: Framework Summary. Erasmus et. al., 2016.

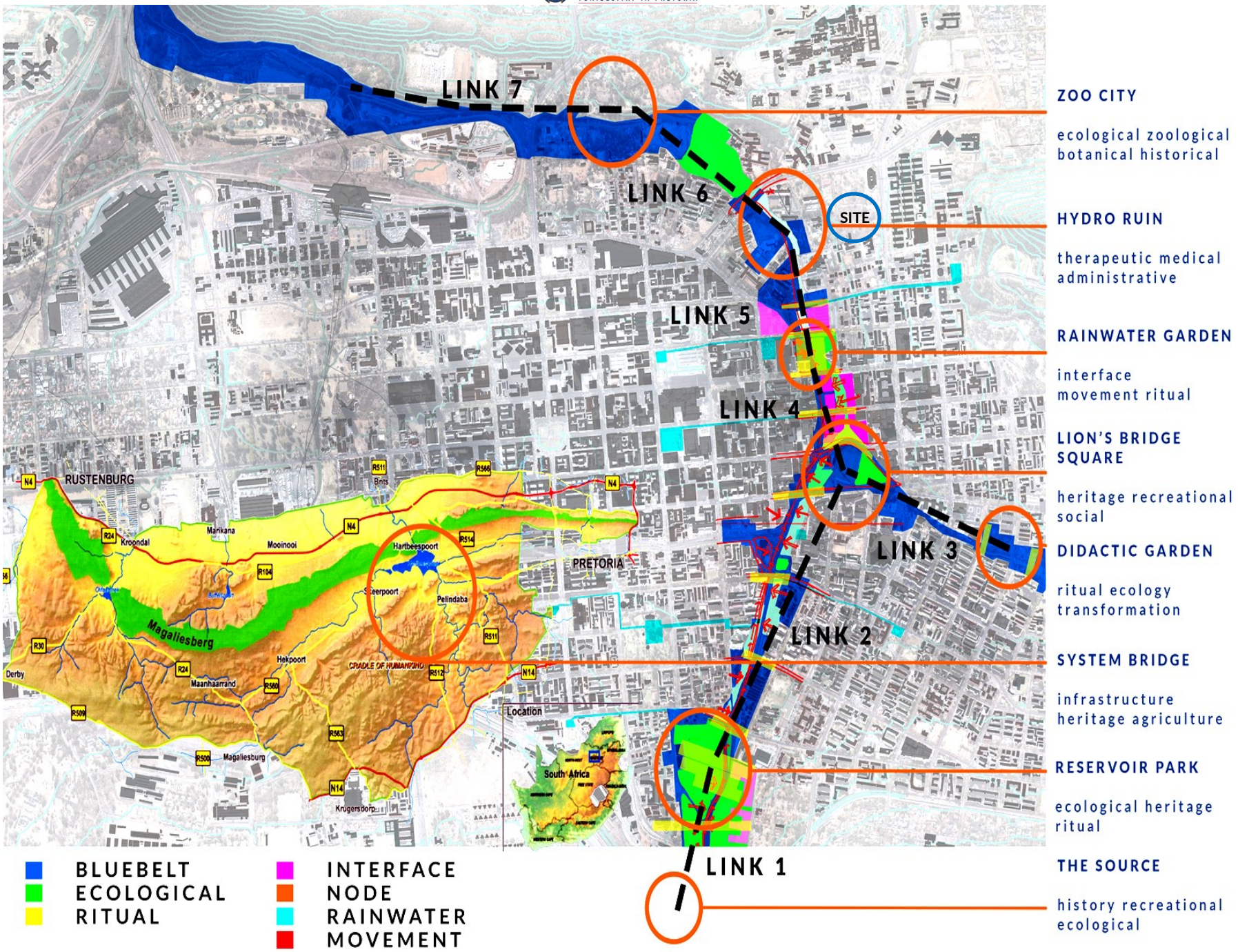


Figure 2.26. Water Group Urban Vision: Intervention river node identities and characteristics. Erasmus et. al., 2016.

2.3 URBAN VISION STRATEGY

2.3.1 INTRODUCTION

The identified layers as shown in Figure 2.25 display inherent river space characteristics (see Figure 2.26) that are intended as a set of urban vision instructions that would help to define the river's potential in promoting river space and attempt to regenerate the surrounding urban condition.

2.3.2 CONCEPTUAL PRECEDENTS

The Los Angeles River Restoration Project (www.asla.org, 2013), (see Figure 2.27), which focuses on the Los Angeles River in California in the United States, identified certain aspects in relation to the river which are similar to those identified with regard to the Apies River by Erasmus et al. (2016). These aspects include making river space physically accessible, naturalising the river in its urban setting, and blurring interfaces between man-made and natural systems.

The Jones River Falls in Baltimore, United States applies a framework concept based on the spatial translation of water infrastructure as urban nodes, i.e. valve and pump systems. (see Figure 2.28) provides a conceptual approach which can be used in the process of designing river spaces. If applied to the Apies River, such an approach would have to take into account the scalar difference between the Jones River and the Apies River, and its current eco-systemic status.

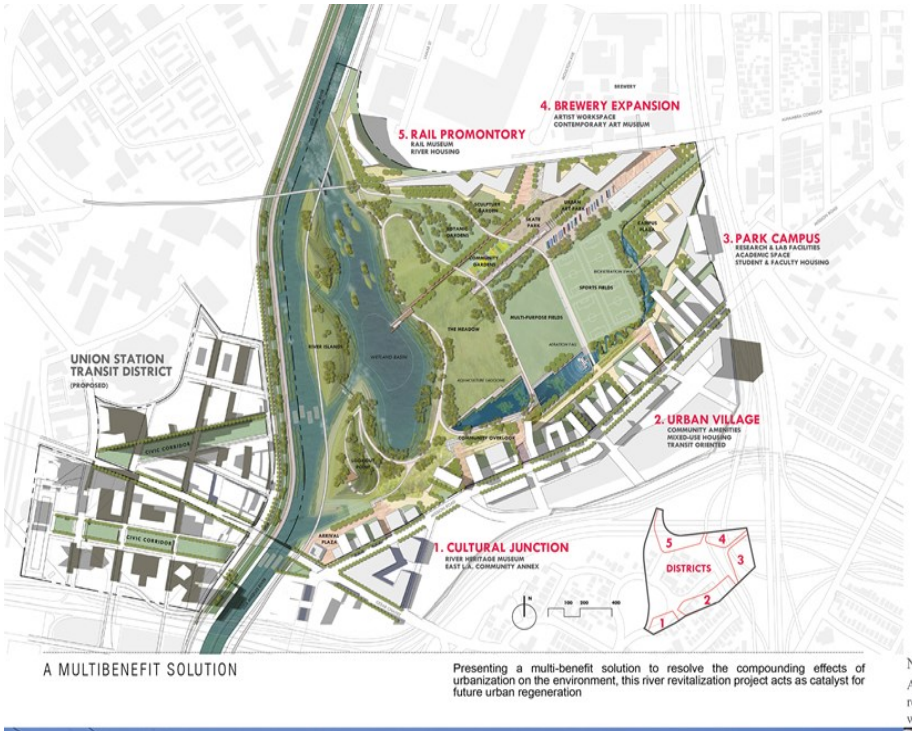
2.3.3 REALISED PRECEDENTS

The Manzanares River in Madrid (mivaidaen.sampere.com, 2011.) (see Figure 2.29) provides a tangible visualisation of and comparable method for incorporating a river into the urban grain of a city. Another example is the Zhangjiagang River Restoration Project (www.archdaily.com, 2014) (see Figure 2.30), which provides ideas regarding how to open up cities to rivers and how to make spaces alongside them for public use.

2.3.4 INFRASTRUCTURE TYPOLOGIES

As a potential strategy, water infrastructure devices or interventions provide the designer with a tangible method of realising eco-systemic services when working with rivers (see Figures 2.31). Water infrastructure interventions can be seen as a tangible solution to various problems relating to river spaces and can be re-interpreted and contextually adapted to fit the physical limitations of a particular site (see Figure 2.32).

Figure 2.33 also represents this approach in relation to linked spaces in between the nodes along the Apies River. Such devices encourage regeneration of cities from the river's location outwards. Figure 2.34 shows the potential vision of the proposed intervention as part of the river framework's set of strategic points for regenerating the city and working with the Apies' River as a natural resource.



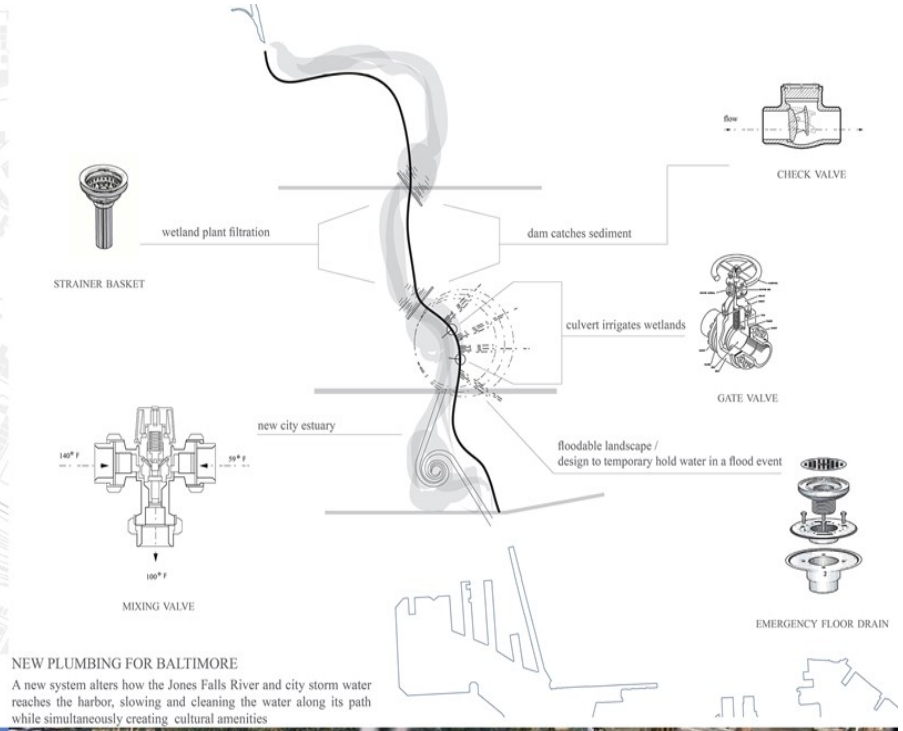
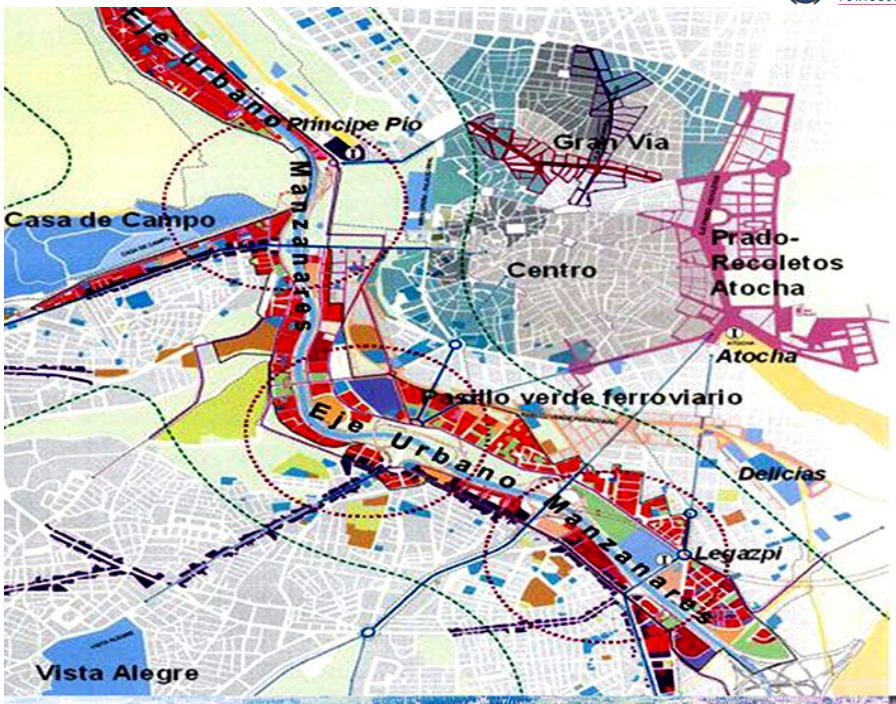


Figure 2.27. Los Angeles River Restoration. www.asla.org. 2013.

Figure 2.28. Alchemy of an urban estuary: Jones River Falls. www.asla.org. 2010.



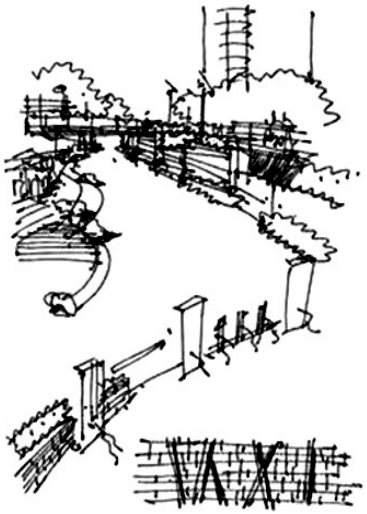


Figure 2.29. Manzanares River, Madrid. mivaidaen.sampere.com. 2011.

Figure 2.30. Zhangjiagang Urban River Restoration. www.archdaily.com. 2014.

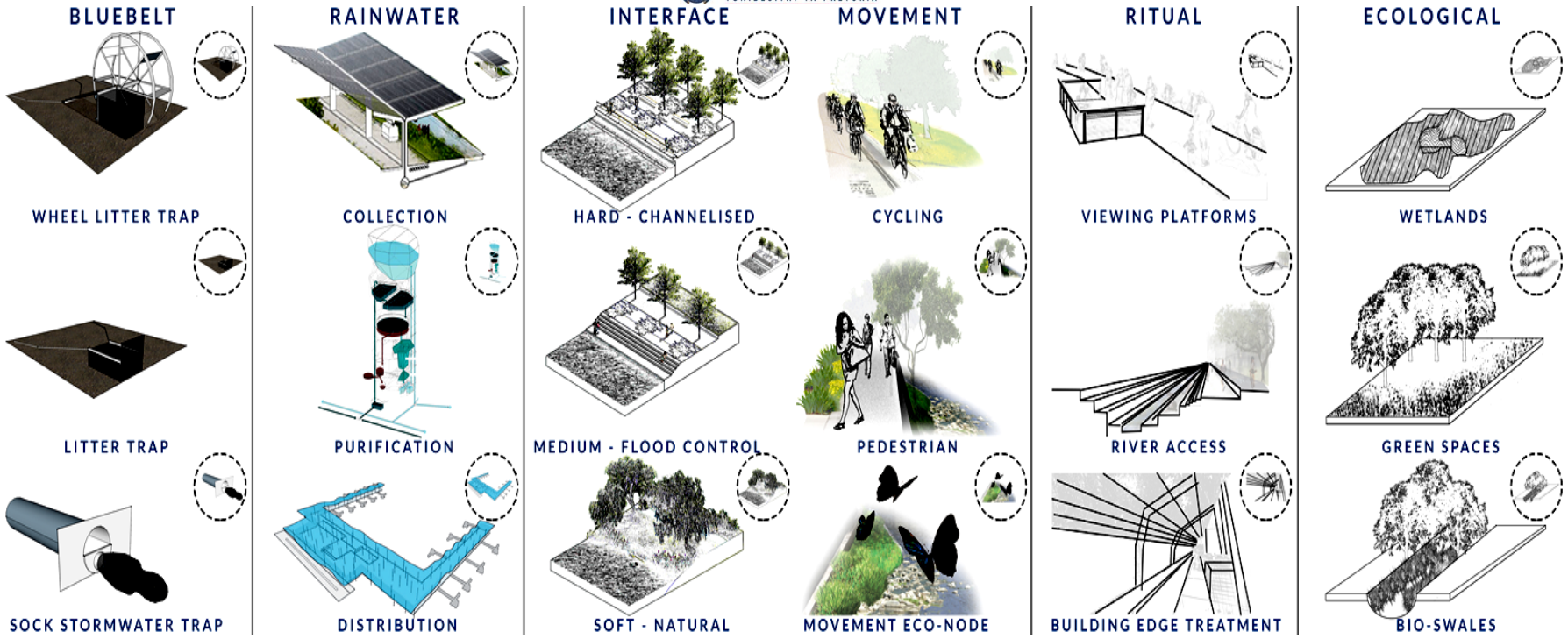


Figure 2.31. Water Group Urban Framework Nodal Strategies: Infrastructural and Architectural Water Typologies. Erasmus et al., 2016.

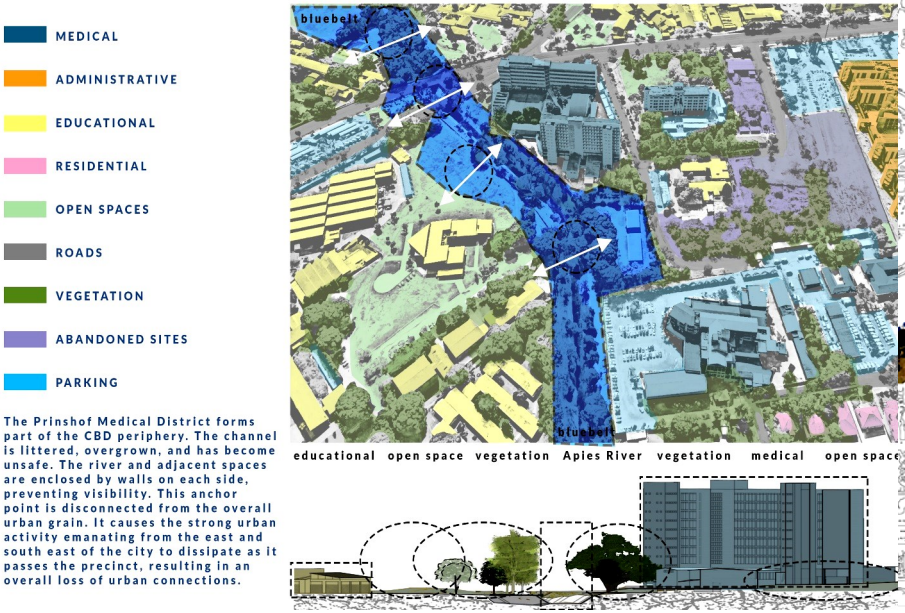


Figure 2.32. Water Group Urban Framework Node Analysis. Erasmus et. al., 2016.

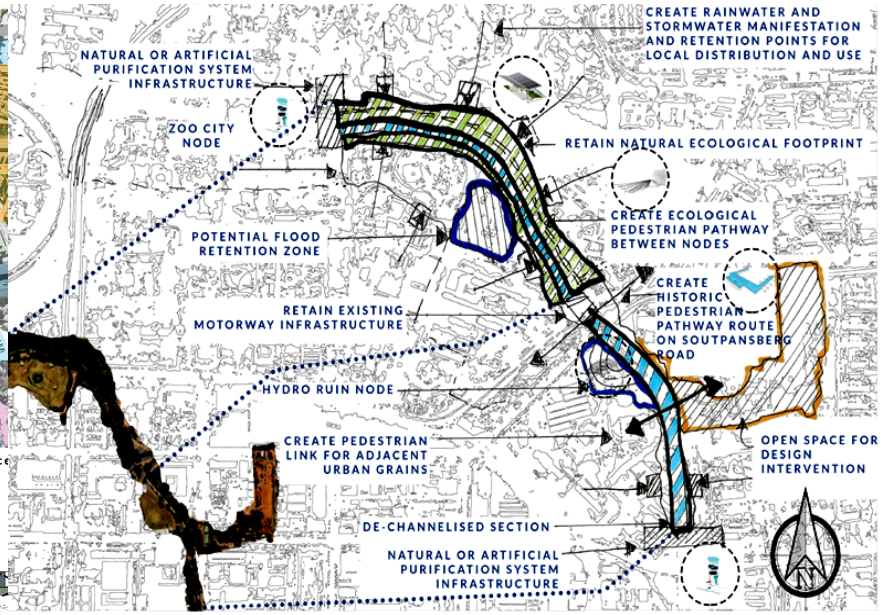


Figure 2.33. Water Group Urban Framework: Link analysis. Erasmus et al., 2016.

Figure 2.34. Water Group Urban Framework Imagined perspective along the Apies River. Erasmus et al., 2016.

2.4 SITE: PHYSICAL CONTEXT

2.4.1 RIVER SPACE

The former Hove's Drift is currently overshadowed by separate and privately accessed medical, social, and administrative land uses and building functions, as previously mentioned. The area is neglected, which has resulted in its abandonment (see Figure 2.35). Also as previously introduced, the site is overgrown with trees, shrubs, and tall grass (see Figure 2.36), and the river only serves to convene the passing sewerage water (see Figure 2.37). There are physical barriers or structures which keep the public away from this segregated, channelized entity (see Figure 2.38). However, despite these negative conditions, within the extents of the site, it was observed that the river has a stable embankment, and the channel is in a relatively stable and clean condition.

2.4.2 OPEN SPACE

The site node context is seen as left-over space in its overall urban setting (see Figure 2.39 and Figure 2.40). No vistas, views, or visual connections are enhanced, and little has been done to exploit the possibility of creating a comfortable urban experience. Fresh groundwater has been identified in the surrounding areas (see Figure 2.41). In addition, the surrounding areas are covered in dense vegetation which is both indigenous and exotic (see Figure 2.42).

2.4.3 BUILT SPACE

Structures are scattered over large institutional terrains (see Figure 2.43), concealing the 'openness' of the area from the public urban realm. Furthermore, structures obscure the view of the river and hide it from the public (see Figure 2.44) . A taxi rank, as well as numerous street vendors, can be found on Du Toit Road and Soutpansberg Road. The entrance to the Pretoria Academic Hospital exhibits heavy traffic.

River spaces are not defined. The greater urban character accommodates educational and light-industrial (see Figure 2.45) and administrative (see Figure 2.46) building functions as found on the northern part of the site.

Figure 2.35. Apies River at the SG Lourens Nursing College . Author, 2016.

Figure 2.36. Theodore Hove Street near the SG Lourens Nursing College. Author, 2016.

Figure 2.37. Apies River section towards Dr John Savage Road. Author, 2016.

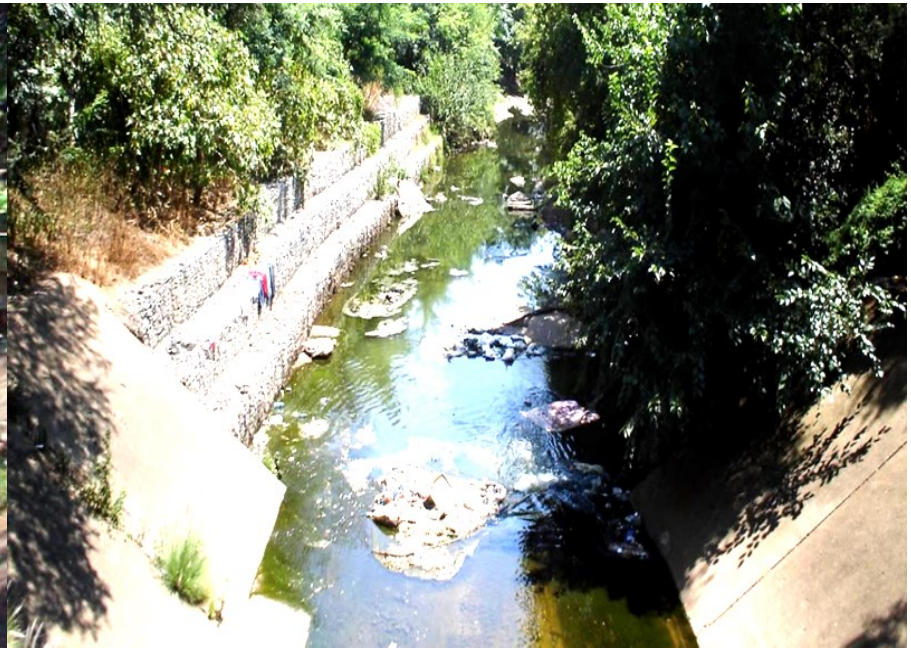


Figure 2.38. Apies River section after Dr John Savage Road. Author, 2016.

Figure 2.39. Site vista on Theodore Hove Street. Author, 2016.

Figure 2.40. Abandoned site on the edge of Theodore Hove Street. Author, 2016.

Figure 2.41. Groundwater found on open site on Theodore Hove Street. Author, 2016.

Figure 2.42. Obsolete infrastructure on the side of Oumashoop Street. Author, 2016.