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N<sup>o</sup> 3

# Liquid Urbanism

Group Vision 2016

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## 3.1 Status Quo

All living organisms depend on water for their continued survival and it is a fundamental ingredient for all life. This is perhaps why water has always had significant cultural, religious and spiritual connotations in most cultures. It is, however, also one of nature's most destructive forces and as such the relationship between mankind and the hydrosphere has always consisted of the contradictory pairing of life and death. Large scale transformations of the natural landscape, to build water infrastructure in order to control water, are therefore attributed to both the inherent dangers water poses, and man's dependence on the resource for his survival (Brownell & Swackhamer, 2015:68).

Channelisation, culverting, damming, abstraction, urbanisation and pollution negatively impact and impede the natural ability of rivers and their catchment areas (surrounding landscapes) to provide ecosystem services [River Restoration Centre (RRC), 2014] Pressing concerns of urban water scarcity and water quality, especially in a dry country such as South Africa, motivate innovative solutions to improve water management, quality and efficiency (ActionAid, 2016:6)

As discussed in Chapter 2, eco system services also include cultural services related to the quality of urban life and human wellbeing. The degradation and alteration of river systems in urban areas consequently hinder the ability of river systems to function as place-making resources and to spatially contribute to the urban environment. With the aim of creating future cities, where nature is integrated into urban life, riverine restoration and alternative approaches to managing urban water bodies and their surrounding catchments are essential.



Figure 3.1 ~ River corridor.jpg

2016 Liquid urbanism, Water urban vision focus corridor  
Source: author



Figure 3.2 ~ Spiritual and cultural significance of water.psd

Spiritual and cultural significance of water

Description: Church Hokkaido, Japan, by Tadao Ando  
Source: Ji Young Lee (www.archdaily.com), amended by author



Figure 3.3 ~ Spiritual and cultural significance of water.psd

Spiritual and cultural significance of water

Description: Water-Moon Budist Monastery, by Artech Architects  
Source: Jeffrey Cheng (www.archdaily.com), amended by author



Figure 3.4 ~ Threegorgesdam-controlledinfrastructure.jpg

Water infrastructure

Three Gorges dam, Yangtze River, China

Source: <https://www.emaze.com/@ACCIOFZO/THE-THREE-GORGES-DAM>, amended by author



Figure 3.5 ~ Culverted River - controlled infrastructure.png

The culverted River Medlock in the industrial landscape of Manchester a century ago

Source: Environment Agency, (<https://www.theguardian.com/environment/2013/oct/13/britain-lost-rivers>)



## 3.2 Synopsis: Present day Pretoria River Network



STEENHOVEN SPRUIT



APIES RIVER



WALKER SPRUIT

Figure 3.6 ~ Apies and tributary streams.jpg

The Apies river and two tributary streams, the Steenhoven spruit and Walker spruit

Source: Author

The Apies River and its tributary streams once provided a generous supply of fresh water and many other natural, societal and social services to the inhabitants of the Pretoria valley. At present, meeting the water demand of Pretoria requires utilising the full capacity of its springs at Upper and Lower Fountains, Rietvleidam, Grootfontein and Sterkfontein, and furthermore greatly depends on additional water supplied by Magalies Water and Rand Water (Loots, Van Dijk, Van Vuuren, Bhagan & Kurtz, 2014:4).

The current water and environmental crises and the observed disconnection between the city and its rivers, motivated the study undertaken by the 2016 Liquid Urbanism Group Vision (LU Group Vision) to investigate Pretoria's river networks and water bodies in relation to their urban conditions as the basis of an urban vision and ultimately a generator for architectural design. Emphasis is placed on the Apies River channel and adjacent landscapes or urban areas in terms of their value and contribution (currently) to the urban environment and inhabitants of Pretoria. Mapping studies, observations and the collection of data assessed the potential ecological, infrastructural, cultural, social and recreational value of the river network and the condition of the urban fabric of the areas located along the Apies River corridor, within the limits of the inner city.

The altered and channelised Apies River, Walker Spruit and Steenhoven Spruit have been altered to such an extent that they are no longer able to function as natural resources. The channels are observed to be in a state of neglect with debris, litter

and garbage frequently located in and along the channels. Signs of quotidian use such as washing and the use of the river and streams as an amenity are also evident. This in conjunction with the discharge of contaminated and untreated runoff from the city roads and storm water system leads to increased levels of water pollution in the channel.

A study of the built fabric and open space adjacent to the Apies River indicates that an active and positive interface between the city fabric and river corridor is lacking. The road infrastructure, specifically Nelson Mandela Drive, forms a barrier that dissects the river channel and restricts any interaction with the sunken river channel. This barrier further stifles integration and the experience of the river in the city. The once mighty river has been reduced to an unnoticed

trickle of brown liquid flowing along the inner city edge.

The state of the river has undoubtedly contributed to the pockets of negative spaces, fraying edge conditions and lack of cohesion that are observed in the inner city. The open areas and green spaces surrounding the river channel are in poor condition. These neglected spaces are perceived to be unsafe, and are avoided due to accounts of crime occurring in the vacant and unprogrammed areas.

In general the river within the inner city lacks ecological, social and recreational value. The city shows little trace of the relationship it once had with the river and its streams. In its present state it is unable to generate prospects of harmonious coexistence between the orders of man and nature and consequently further induces the divide between man and the natural environment.

## 3.3 Urban River Restoration

**R**iver rehabilitation, as an approach to overturn the adverse effects of human over-domination and over-exploitation of water resources, is a relatively recent development (Tourbier, Gersdorf, Schwager, Scahnze & Olfert, 2014:04).

Characteristics of urban rivers differ vastly from those in rural settings as a magnitude of intervention and human impact has shaped the urban and artificial riverscape as we know it today (Tourbier et al., 2014:03). In the urban context rehabilitation schemes are very challenging and complex, as they significantly affect both the river network and surrounding areas across a broad spectrum of levels (Tourbier

et al., 2014:59). Subsequently, many factors, social, political, cultural and economic, limit the extent of urban river recovery.

It is, however, important to note that partial recovery, or any improvement at different scales, is encouraged as re-naturalisation and large scale interventions are seldom viable and often impossible. Any rehabilitation, re-naturalisation and enhancement of natural systems may yield invaluable benefits (RCC, 2014) and the many urban river rehabilitation schemes, albeit at different scale currently active across the world, motivate the intentions of the LU Group Vision 2016.

## natural connection

degraded river embankment  
no physical connection to water

Existing River Embankment with Historic edge. Coetzee, M. 2014

## urban connection

stormwater from roads polluted  
degraded sidewalks

Existing Urban Context. Coetzee, M. 2014

## parks connection

polluted water  
no connection to river

Existing River Along a Park Space. Coetzee, M. 2014

## bridges and roads

no physical and lack of visual  
connection

Existing Infrastructure along bridges and roads. Coetzee, M. 2014

Figure 3.7 ~ Edge conditions.psd

The Apies river edge conditions

Description: The sunken river condition and a lack of spatial interfaces and integration between the city fabric and the river has contributed to the development of negative spaces along the river corridor

Source: Urban vision group





Apies River Conditions.  
Kelly, S. 2016



Apies River Conditions.  
www.earth.gogle.com.  
2016



Apies River Conditions.  
www.earth.google.com.  
2016









Apies River Conditions.  
www.earth.google.com.  
2016



Figure 3.8 ~ Apies river channel.jpg Source: Author

## legend

-  concealed furrows
-  parks connection
-  urban connection
-  natural connection
-  natural to urban node
-  railway bridges and roads connection

Spatial intersections and interchanges indicate where the condition of the river changes.

There are five different conditions of the river space:

- \_Fountains Valley
- \_NZASM Bridge within Fountains Valley
- \_Railway Bridges and Roads
- \_Parks Connection
- \_Urban Infrastructure



## 3.4 Urban Vision Precedent: Los Angeles River Restoration

The Los Angeles River Revitalisation Master Plan (LARR Master Plan) was developed over a period of 10 years and involves restoring and converting 32 miles of concrete channelised river to public green spaces that could induce socio-economic revitalisation and restore ecological value [American Society of Landscape Architects (ASLA), 2009].

Similar to Pretoria, the city of Los Angeles is characterised by sprawling development, road infrastructure and water stress, drawing most of its water from the Sierra Nevada Mountain catchment located 230 miles from Los Angeles, and the Los Angeles River has also lost its meaning and identity. Los Angeles sources more of its water beyond its natural catchment area than any other city in the world (ASLA, 2009; Borell, 2015).

The LARR Master Plan, which will be implemented in a phased approach over the course of the next twenty five to fifty years, outlines the following main objectives:

- Revitalise the river;
- Green the neighbourhoods;
- Capture community opportunities;
- Create value;
- Develop community planning frameworks based on the river; and
- Create a River Management Framework.

Flood and water storage, public access, improvement of water quality and eco system restoration are main strategies for revitalising the river. The current channelised river will be transformed with identified areas converted to new landscaped terraces that will create new habitat environments for wildlife, generate opportunities for water treatment, and function as public interfaces and access points (ASLA, 2009).

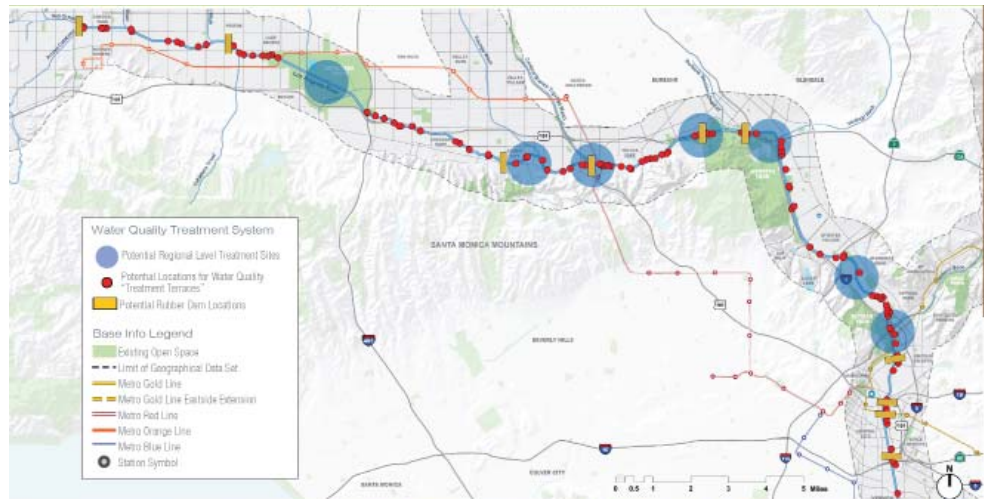
The LARR Master Plan intends to reinstate value to the undervalued resource through impacting adjacent neighbourhoods. Outlined goals consist of (1) the creation of a continuous River Greenway that serves as the city's "green spine"; (2) reconnection of neighbourhoods to the river through a system of "green streets"; (3) recapture of under-utilised or brownfield sites in park-poor areas as neighbourhood parkland, and incorporating storm water management practices into all public landscapes; (4) enhancement of the river identity through signature bridges and gateways, and through programmed events; and (5) incorporation of public art along the river (ASLA, 2009).

Formulating similar strategies on a smaller scale relevant to the context of Pretoria and the Apies River could similarly generate new meaning, opportunities and ecological infrastructure to assist in alleviating urban water stresses.

The extensively channelized Los Angeles river is a lifeless concrete spine that cuts through the Los Angeles landscape  
Source: Lane Barden (<http://www.metropolismag.com/July-August-2014/Mia-Lehrer-the-LA-River/>)



Figure 3.9 ~ Los Angeles river.jpg



Los Angeles River Revitalisation  
Source: Asla 2009

Figure 3.10 ~ Los Angeles Revitalisation.jpeg

## 3.5 Urban Vision

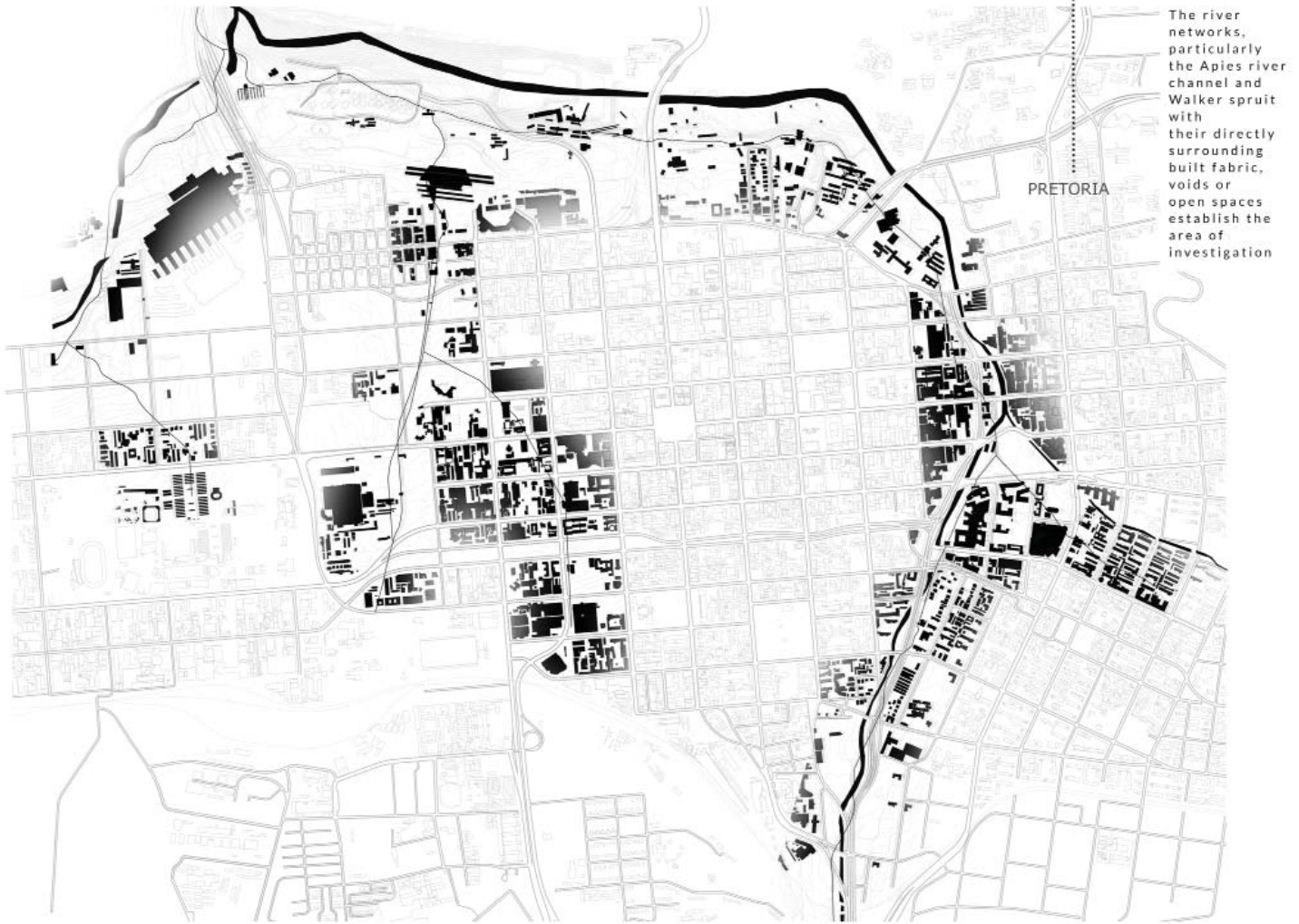
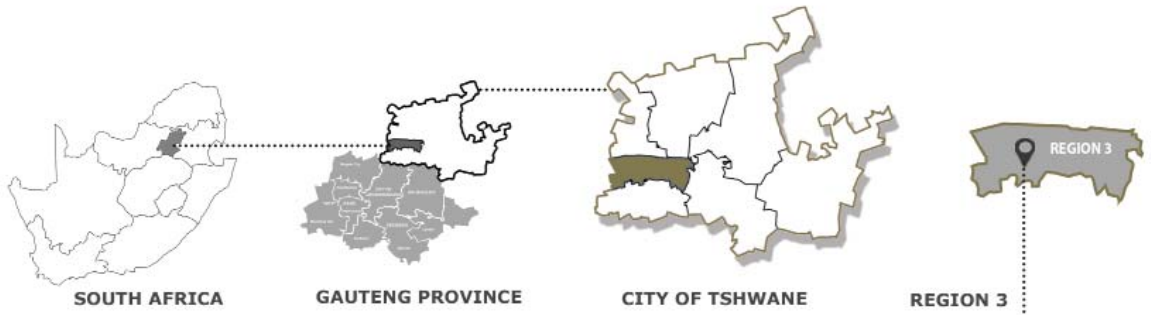
The LU Group Vision identified eight catalyst nodes, located along the Apies River channel, the Walker Spruit and the Hartbeespoort Dam, which form the focus areas for intervention and individual projects. The nodes were selected for both the identified challenges and potential they hold, which would contribute to the broader aims of employing regenerative strategies to restore and revitalise points along the river to regenerate the urban environments and/or landscapes adjacent to the networks. Each group member of the LU Group Vision will deal with different aspects, and will place different emphasis on issues related specifically to their intentions and the context of their selected node in design projects. Specifics regarding the Reservoir Park Node, selected as the area of focus for this dissertation, will be discussed in the following chapter.

The Apies River has lost its natural character and natural flow regime firstly due to channelisation, and secondly because of the diversion of the bulk of the water from Fountains directly to reservoirs. The Apies River has for the largest part consequently been reduced to a polluted storm water channel in which runoff from the city's road network is discharged. Re-naturalisation and successful regeneration of the river network would thus depend on a

complete restructuring of the central city storm water system, as well as large scale land and urban changes in populated built up areas, and would be extremely costly. It is therefore not considered to be a feasible option in Pretoria's current context and the LU Group Vision instead proposes smaller interventions that will celebrate the history and memory of the river, by establishing new water elements and interfaces in the selected nodes along the river. This may include abstraction of water from the river channel or harvesting rainwater to create new water spaces, green corridors and public spaces in the city to provide ecosystem services and places for daily rituals, activities and events, which may install new meaning along the derelict river corridor.

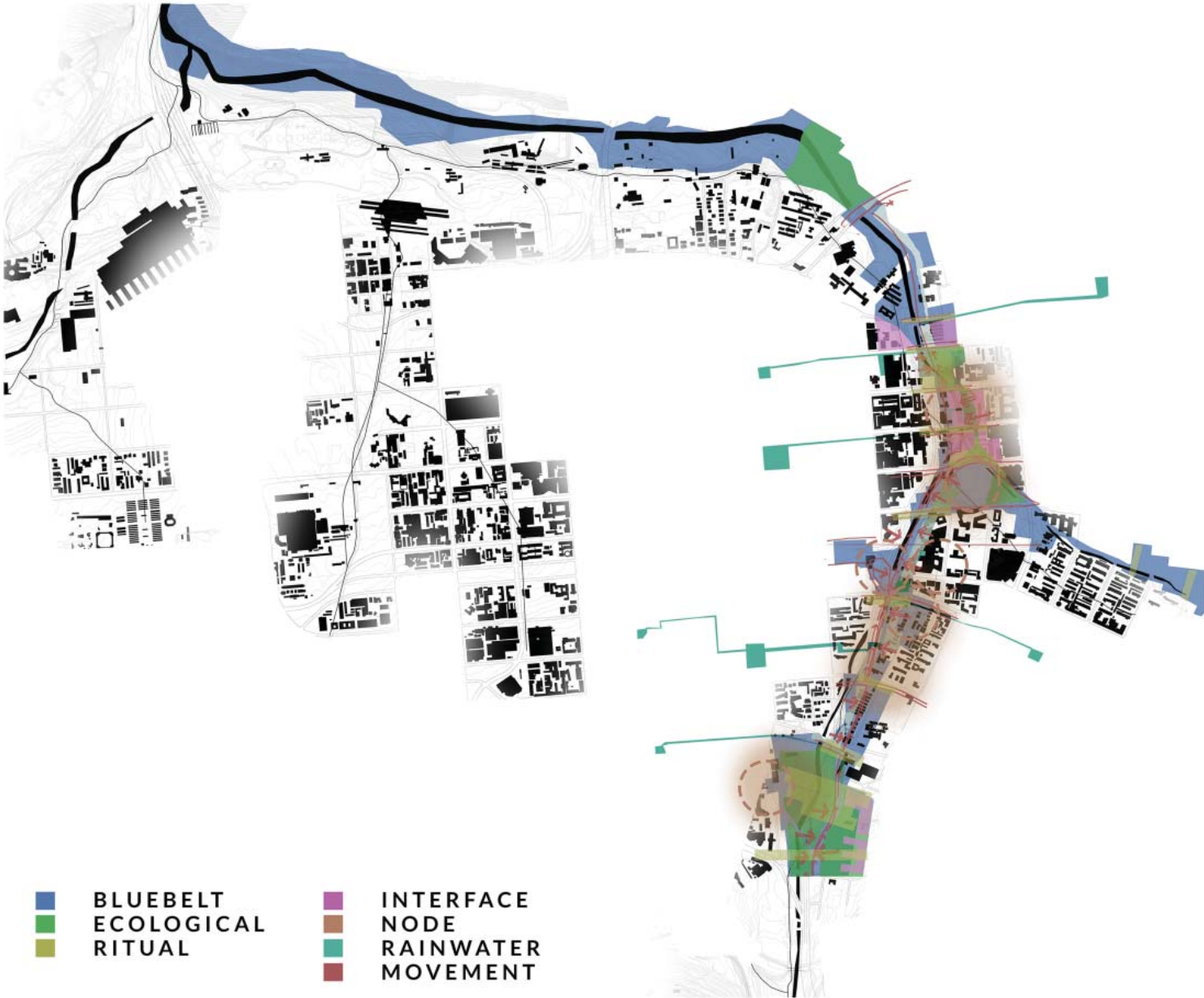
The LU Group Vision in broad advocates symbiotic responses where proposed development within the nodes is intended to harmonise natural and man-made systems, blend natural landscapes and human artifices in a manner that is appropriate to its context, reinstate lost significance and identity, encourage movement, expand green, ecological and bio-diverse spaces, and support the other vision nodes as part of a series of interventions.



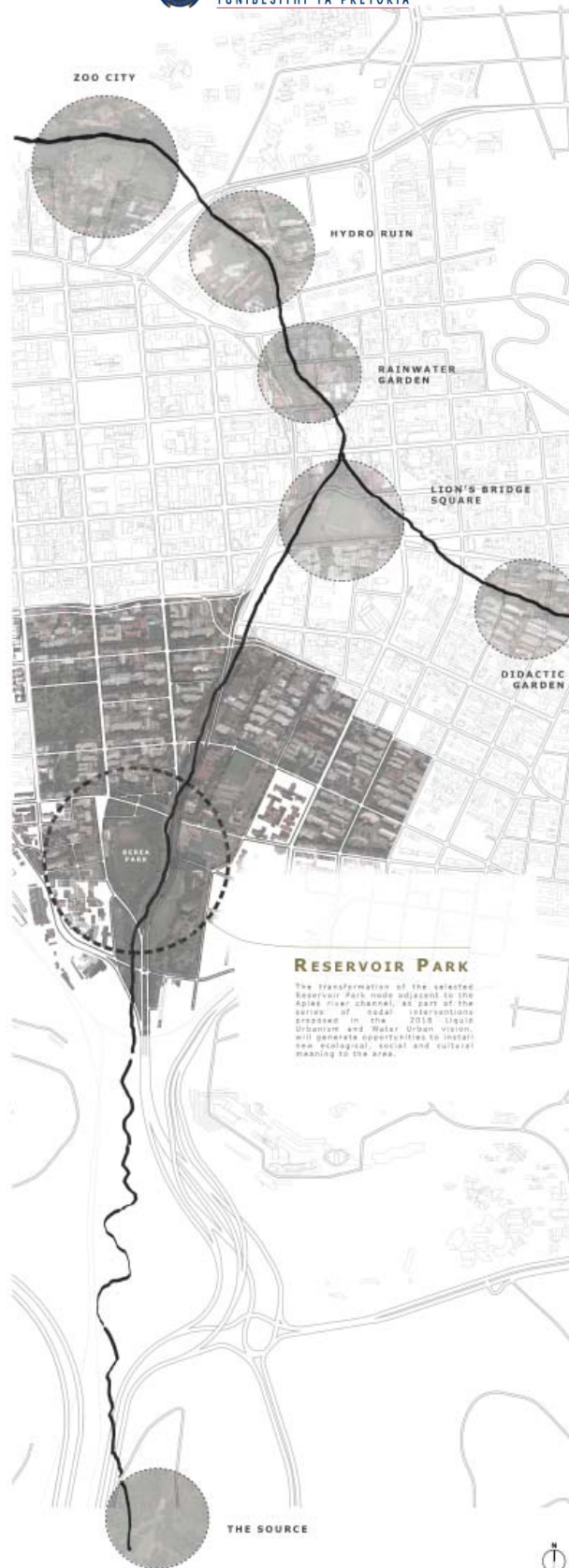


2016 Liquid urbanism, Water urban vision focus area  
Source: Urban vision group  
Figure 3.11 ~ Vision focus area.jpeg





Urban vision, diagrammatic intention derived from a layered mapping exercise  
Source: Urban vision group  
Figure 3.12 ~ Urban vision.jpeg



Source: Author  
Figure 3.13 ~ LU Group vision nodes.jpg