The lost and hidden water of São Paulo
THE STRATEGIC VALUE OF LANDSCAPE-BASED GREEN-BLUE INFRASTRUCTURE

MASTER THESIS URBANISM - TU DELFT
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Set of drawings
Figure 1: Metropolitan region of São Paulo within the Alto-Tietê watershed.

Legend:
- Water
- Urbanisation
- Sub-watershed border
- A-T watershed border

Metro regions:
- Penha-Pinheiros
- Billings-Tamanduatei
- Cotia-Guarapiranga
- Juquiri-Cantareira
- Pinheiros-Pirapora
- Cabeceras
Figure 2: The main rivers and reservoirs of the watershed, located in the valleys formed by the rivers themselves.

Legend
- **River**
- **Reservoir**
- **Ocean**
- **Flow direction**
- **High grounds**

Scale: 0 - 25 km

Atlantic ocean
Figure 3: Schematic overview of the system of rivers and reservoirs of the metropolitan region that are connected to serve the water supply of the region.
Figure 4: The metropolis is surrounded by a green-blue belt with multiple protected environments and a diverse nature of forests, fields, rivers and reservoirs.
Figure 5: The Penha-Pinheiros watershed within the metropolitan region and municipality of São Paulo
Figure 6: The elevation map of the watershed clearly shows the historical landscape of valleys and ridges, which is still present underneath the city today. The three main rivers of the watershed, which formed the landscape by incision, are shown with their historical and current, canalized course.
Figure 7: The water system of São Paulo and its different river structures

Legend

Stream typology
- Stream in natural condition
- Underground streams
- Engineered rivers and streams

Elevation
Underground streams

Natural streams

Engineered open water

Sub-watersheds

Elevation and water system

Figure 8: The water system of São Paulo with its different components; watersheds, engineered open water, natural streams and underground streams
São Paulo’s main road infrastructure in relation to the water infrastructure shows a clear relation between valleys and avenues.

- **Avenida** located within valley
- Main road directly on riverside
- Open water
- Underground stream
- Primary road system on elevation
Informal urbanisation has an occupation pattern closely related to the stream valleys and steep slopes.
Figure 11: The different components of the large-scale green-blue infrastructure:

Legend
- Parks
- Green neighbourhoods
- Protected areas
- Open water
- Natural stream
- Main roads

0 km

5 km
Figure 12: The Aricanduva watershed is a key location between the urban core and the metropolitan green-blue belt.

Legend
- Aricanduva watershed
- Forests
- Meadows/fields
- Water
- Urbanisation

0 25 km
Figure 13: A plot of the registered location of urban floods showed the highest occurrence of urban floods in the Aricanduva watershed.
Figure 14: Spatial context of the Aricanduva watershed including the main road system, public transport system and sub-municipal borders.

Legend
- Watershed border
- Main road system
- Metro system
- Ônibus system
- Rivers
- Sub-municipality border
Figure 15: The Aricanduva watershed with the main river Aricanduva, its elevation and the sub-watersheds defined by other streams flowing into the Aricanduva river.
Figure 16: The different layers of the water system of the Aricanduva watershed. There is a clear division between the natural streams in the east and the underground streams in the west. There are multiple engineered reservoirs along the course of the river.
Figure 17: A schematic section of the Aricanduva river at the west of the watershed

Figure 18: A schematic section of the open Taboão stream

Figure 19: A schematic section of the covered Taboão stream

Figure 20: A schematic section of the Gamelinhas stream
Figure 21: The four main components and most important habitat of the current green-blue infrastructure in the Aricanduva watershed.
Figure 22: Location of the sub-watershed Corrêgo Taboão in the Aricanduva watershed

Legend
- **Watershed border**
- **Main road system**
- **Metro system**
- **Ônibus system**
- **Aricanduva river**
Figure 23: The different elements of the Taboão watershed

- Elevation
- Soil
- Streams
- Current green infrastructure
- Road pattern
- Favelas and ZEIS-1 areas
Figure 24: An overview of the strategy on the scale of the Taboão watershed

Legend
- Ecological axis
- Existing green
- Public transport node
- Recreational connection
- Integrated social housing
- Housing development
- Watershed border
- Infrastructural axis
- Ecological stream design
- Facilities
- Sports field
- Education integration

Existing green
Infrastructural axis
Ecological stream design
Facilities
Sports field
Education integration
Figure 25: A schematic section of the current state around the underground portion of the Taboão stream near Avenida Águiar da Beira.
Figure 26: New situation at section A-A' (see Figure 53 on page 91) including a bird’s eye overview of the plan

Legend

- Flood plain
- Mixed massif
- Retained fill
- Public transport node
- Recreational connection
- Integrated social housing
- Housing development
- Ecological stream design
- Facilities
- Sports field
- Education integration
Figure 27: More detailed strategy map of the area surrounding the linear park Taboão
Figure 28: The development concept of the strategy: Ecological axes, infrastructural axes and green/blue interconnections

Figure 29: The strategy implemented on the scale of the Aricanduva watershed

Legend
- Aricanduva watershed
- Taboão watershed
- Ecological axis
- Existing green areas
- Axis Interconnection
- Electricity corridor
- Infrastructural axis
- Main rivers
- Ônibus corridor
- Integrated education/CEU