

Low Impact Development

Low-impact development is a land planning and engineering design approach to manage stormwater runoff as part of green infrastructure.

WHY Resource problem in the cities:
Energy resource pollution and shortage
Water resource pollution and shortage
The environment problem in the cities:
Global climate change
Deterioration of ecological environment

HOW LID design criteria
Enhancing Landscape Biodiversity
Maximizing Water Infiltration and Eliminate Runoff
Managing engineer Hydrology in Distributed Networks

The problems in the world

Resource problem in the cities:
Energy resource pollution and shortage
Fossil fuels pollution
Energy resource shortage
Water resource pollution and shortage
Water resource pollution
Water resource shortage

The environment problem in the cities:
Global climate change
Temperature changes
Impact on precipitation
Wind speed mitigation
Environmental pollution
Air pollution
Soil pollution
Deterioration of ecological environment
Reduction of greening area
Biodiversity is in crisis

4 Key Messages

LID is a **low impact approach** to land development (or re-development) that works with nature to manage stormwater. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness, treat stormwater as a resource rather than a waste product.

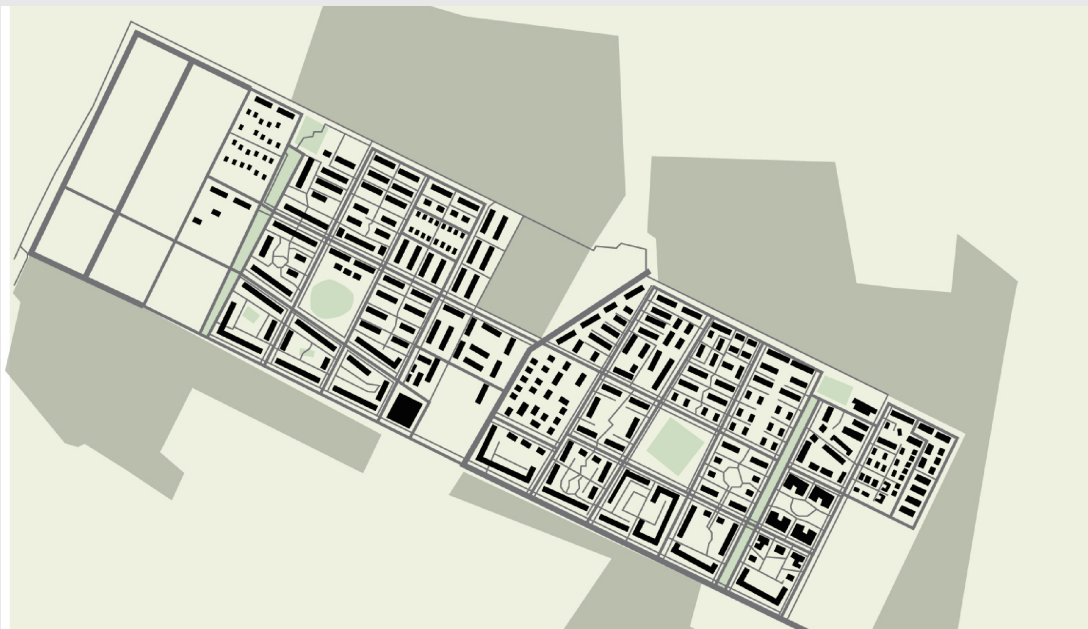
According to the level and intensity of physical and social character of different parts of city, divide it into several **transect zones**, providing immersive contexts from historical urban center to sub-urban to agriculture. Apply LID interventions in several **layers** from building to openspace in each transect zone.

Use the **intervention** such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels and permeable pavements, eco-boulevards, water harvesting parks, etc in four layers of each transect zones.

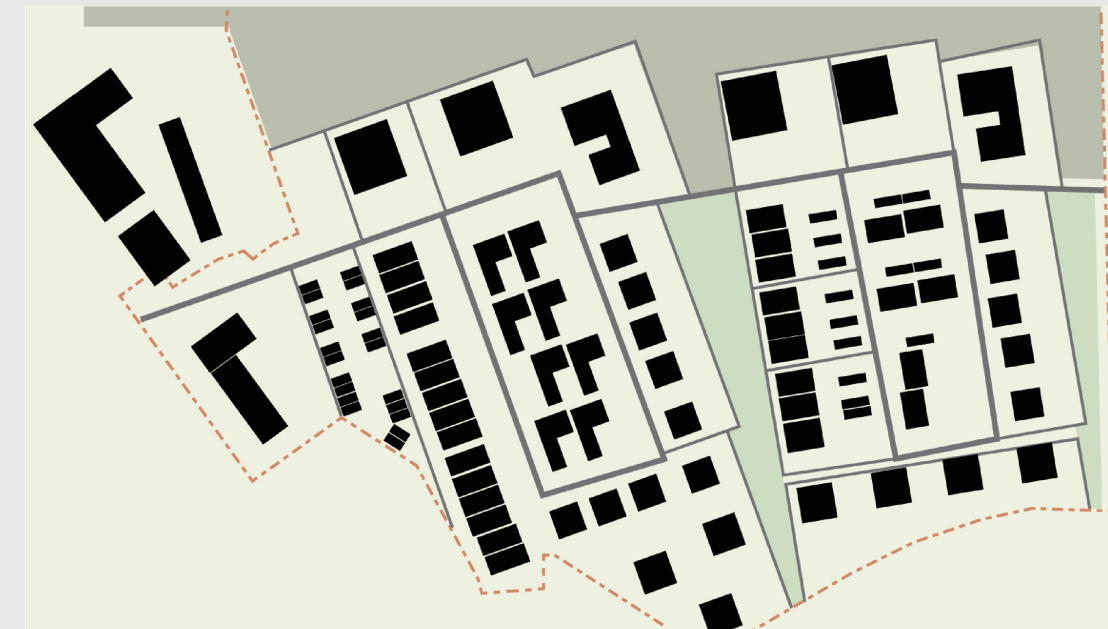
LID have multiple **benefits**. It can improve management of runoff and flooding, improve urban surface rainwater filtration rates, improve groundwater quality and increase its quantity, increase aesthetics, therefore raising community value.

Case study:

1: Arkadien Winnenden
Arkadien Winnenden is located in Winnenden, about 20 km northeast of the city of Stuttgart.
The Zipeibach River flows from the east side of the community. The site is an abandoned factory. Up to 95% of the impervious surface and heavily polluted soil make the area's planning very important to the relationship with the river. By changing the original surface properties, repairing contaminated soil, and using the system's low-impact development facilities, it greatly promotes the retention, infiltration and purification of rainwater, creating a comfortable and pleasant microclimate environment, and restoring the natural water cycle of the site.

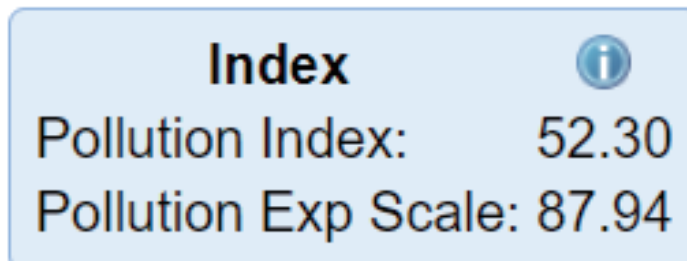
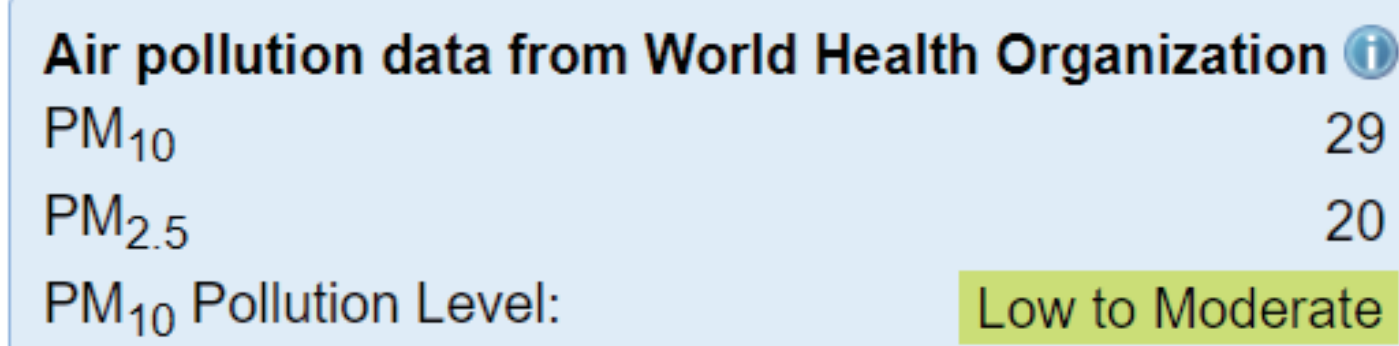
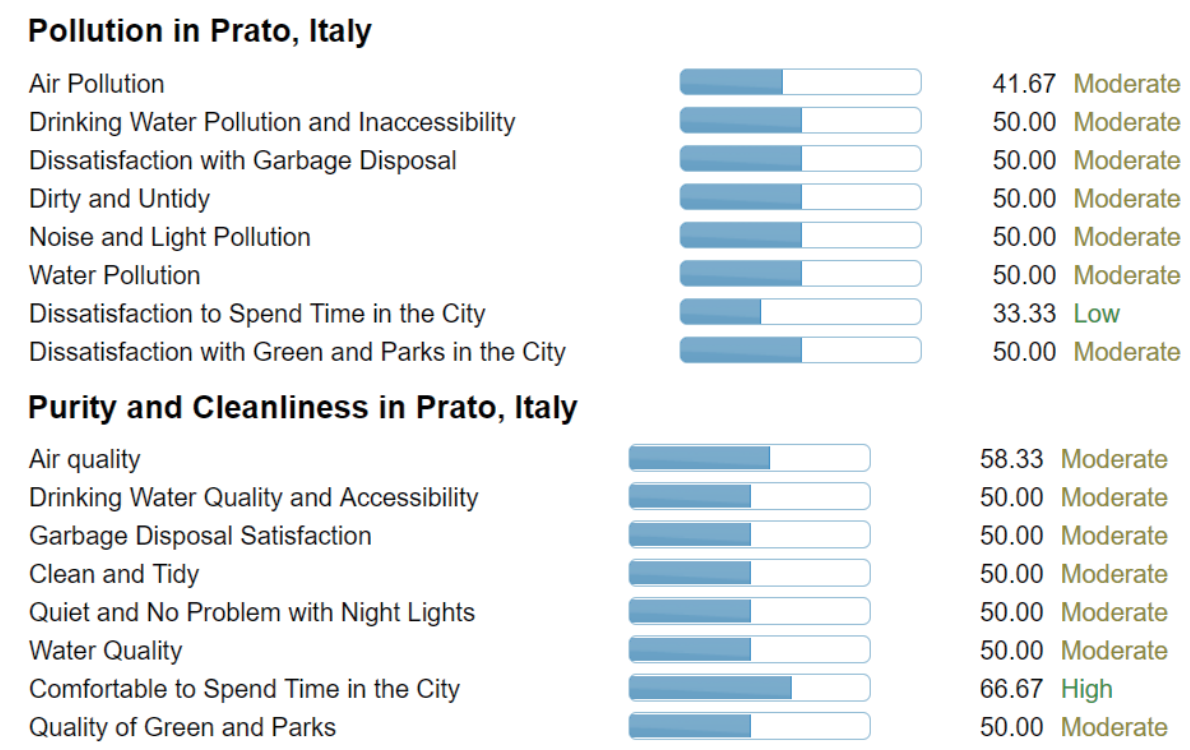


2: Kronsberg Ecological Community
The Kongsberg community is located in the southeastern part of Hannover, the capital of Sachsen, Germany, 9 km from the city centre. The planned total area is 150 hectares, providing 6,000 housing units for 15,000 residents. The community is built with high ecological standards. At present, 63 hectares have been built in the first phase. Its scale and facilities are equivalent to a complete community, including three kindergartens and one Primary school, a middle school, a church and a medical center.
In the early 1990s, housing demand in Hanover was extremely urgent. The Kongsberg area takes advantage of the new concept of housing construction.



Design in Prato

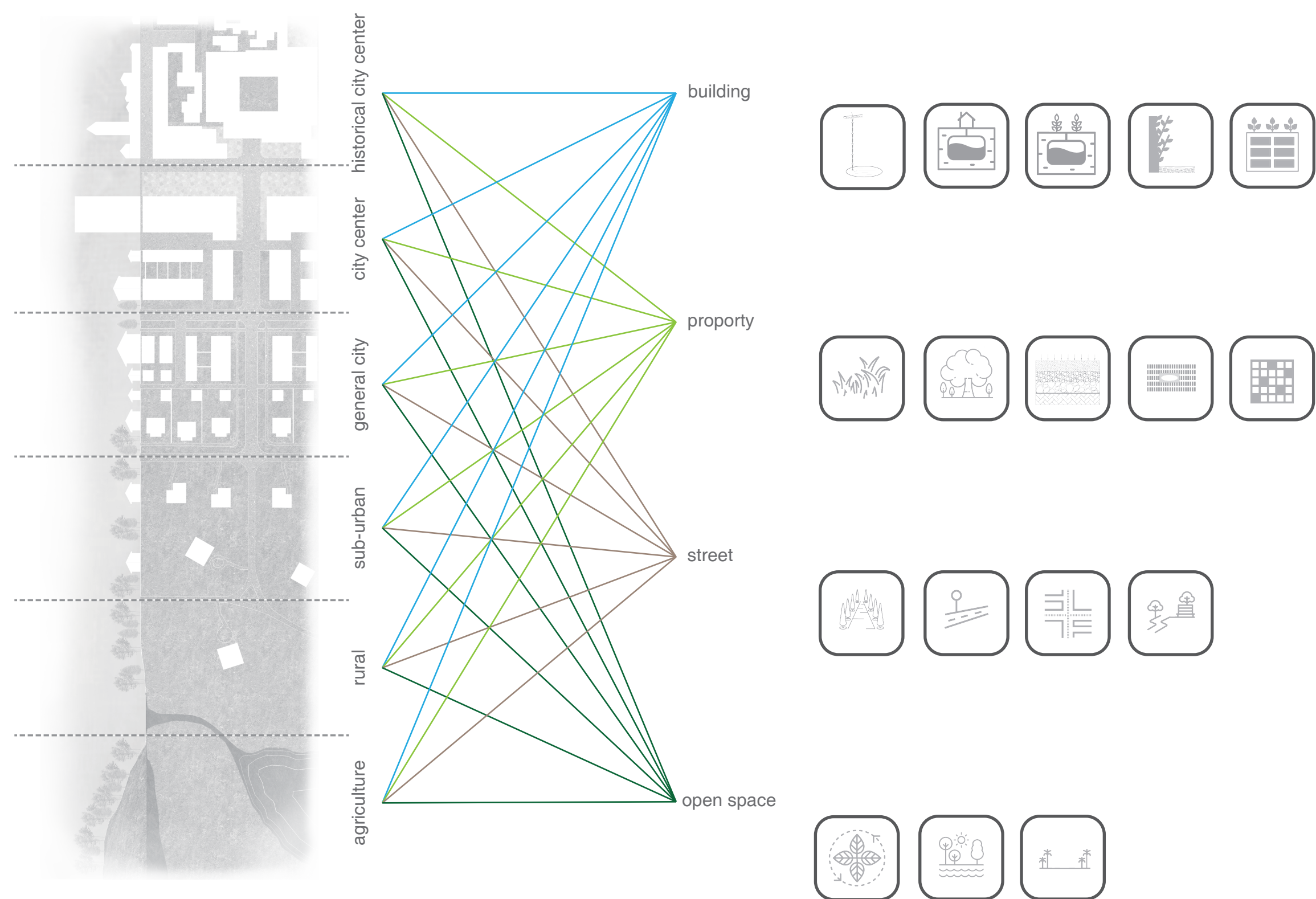
Why the city of Prato adopts LID standards and practices?



Retrieved from: <https://www.numbeo.com/pollution/in/Prato>

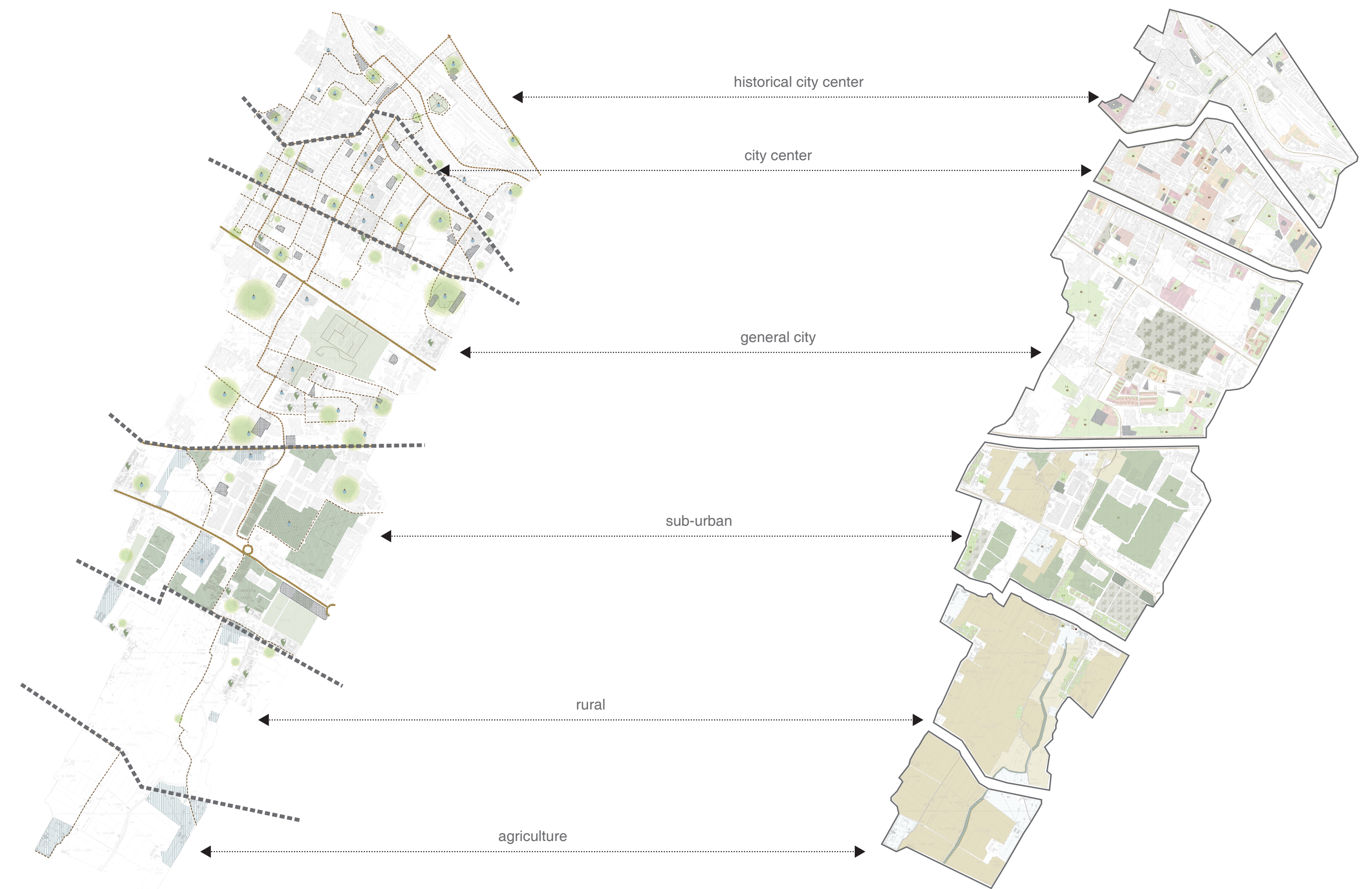
Six transect zones and four layers

code approach



Vision

Concept plan



What could we learn ?

1. Focuses on the **combination of historical districts and landscape facilities** of LID design, do as less as possible by respecting the history and culture of the city.
2. Starting from the urban development process, the main types and basic characteristics, according to the method of urban zoning, the corresponding divisions of historical urban areas, residential areas, industrial areas and agricultural areas are formulated to develop **an adaptable and high flexible smart code**.
3. From building to open space, each intervention not only works on its own layer, but also can form a **network in the city**, to enhance the flexibility of urban planning.
4. LID is to introduce **more natural environment into the city**. The natural environment is a good medicine to solve the modern urban problem. Introducing the natural environment into the urban development can protect the residents from the harsh environment of the city. When natural environmental interventions are integrated with urban prototypes and local cultures of different scales and levels, these natural environments will no longer be both landscape-oriented and functional.