

INTEGRATED PLANNING APPROACHES IN HIGHER EDUCATION:  
COLLABORATIVE EDUCATIONAL PROTOTYPE TOWARDS  
INTEGRATED APPROACHES IN THE PLANNING OF INCLUSIVE,  
PEOPLE-CENTRIC AND CLIMATE-RESILIENT CITIES



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**Project: 2022-1-EL01-KA220-HED-000089374 Erasmus+**  
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## Systems thinking for sustainable development: the SDGs and the role of the urban environment

### InPlanEd COIL Course: Session 1.3



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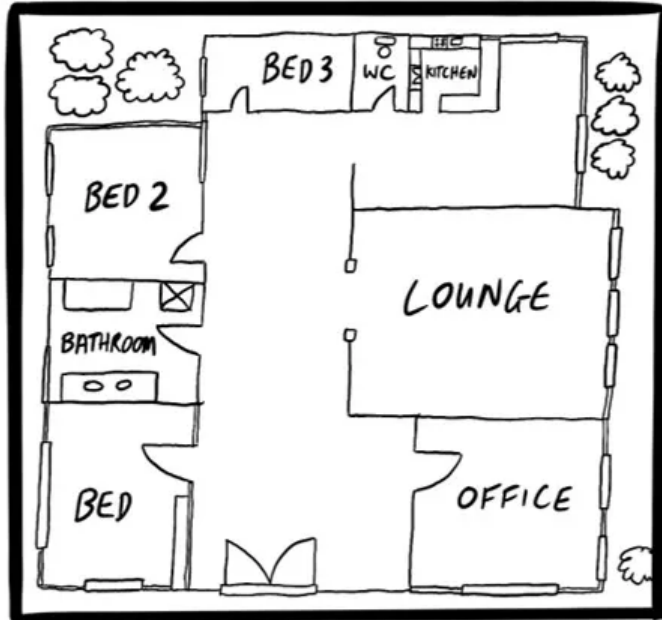
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# What is Systems Thinking?

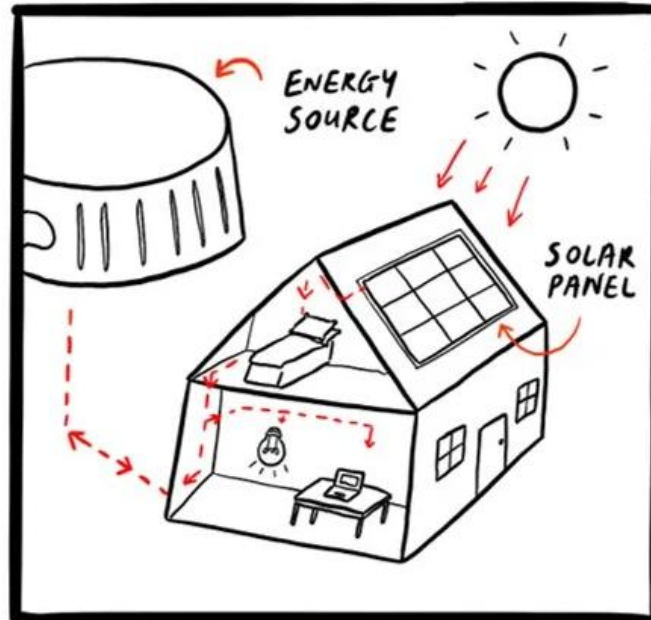
# A linear thinker, a design thinker and a system thinker walk into a bar...



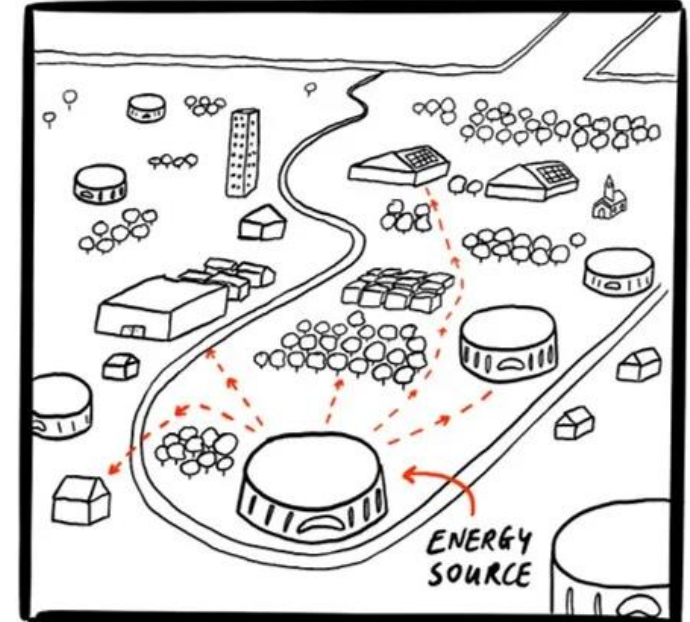
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Linear thinking breaks the world into smaller parts and focuses on each one separately ©Houda Boulahbel.



Design thinking starts from the needs of the user, how they behave, what their needs are, and builds the optimal solution. ©Houda Boulahbel



Systems thinking takes a more holistic view with focus on interactions and relationships between things. © Houda Boulahbel.

You can follow Houda at: <https://medium.com/@houdaboulahbel>

# Definition



Systems thinking is a set of synergistic analytic skills used to improve the capability of identifying and understanding systems, predicting their behaviours, and devising modifications to them in order to produce desired effects.

In the context of urban planning systems thinking is an approach that views cities and urban environments as complex, interconnected systems. It emphasises understanding the relationships and interdependencies among various components, such as infrastructure, transportation, social dynamics, and the environment. This holistic perspective helps planners analyse the dynamic and often unpredictable behaviour of urban systems, aiming for more effective and sustainable solutions.

# Why is it important?

*“Cities are where the climate change battle will be largely won or lost”*

Antonio Guterres, United Nations Secretary-General



# SUSTAINABLE DEVELOPMENT GOALS



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# SDG 11

## Sustainable Cities and Communities

**Make cities and human settlements inclusive, safe, resilient and sustainable**

- 10 targets
- Multi-level governance is not proposed (SDG17)
- Systems-thinking needed to understand trade-off between goals
- Concept of co-benefit (C40 Cities Climate Leadership Group)

# 11 SUSTAINABLE CITIES AND COMMUNITIES



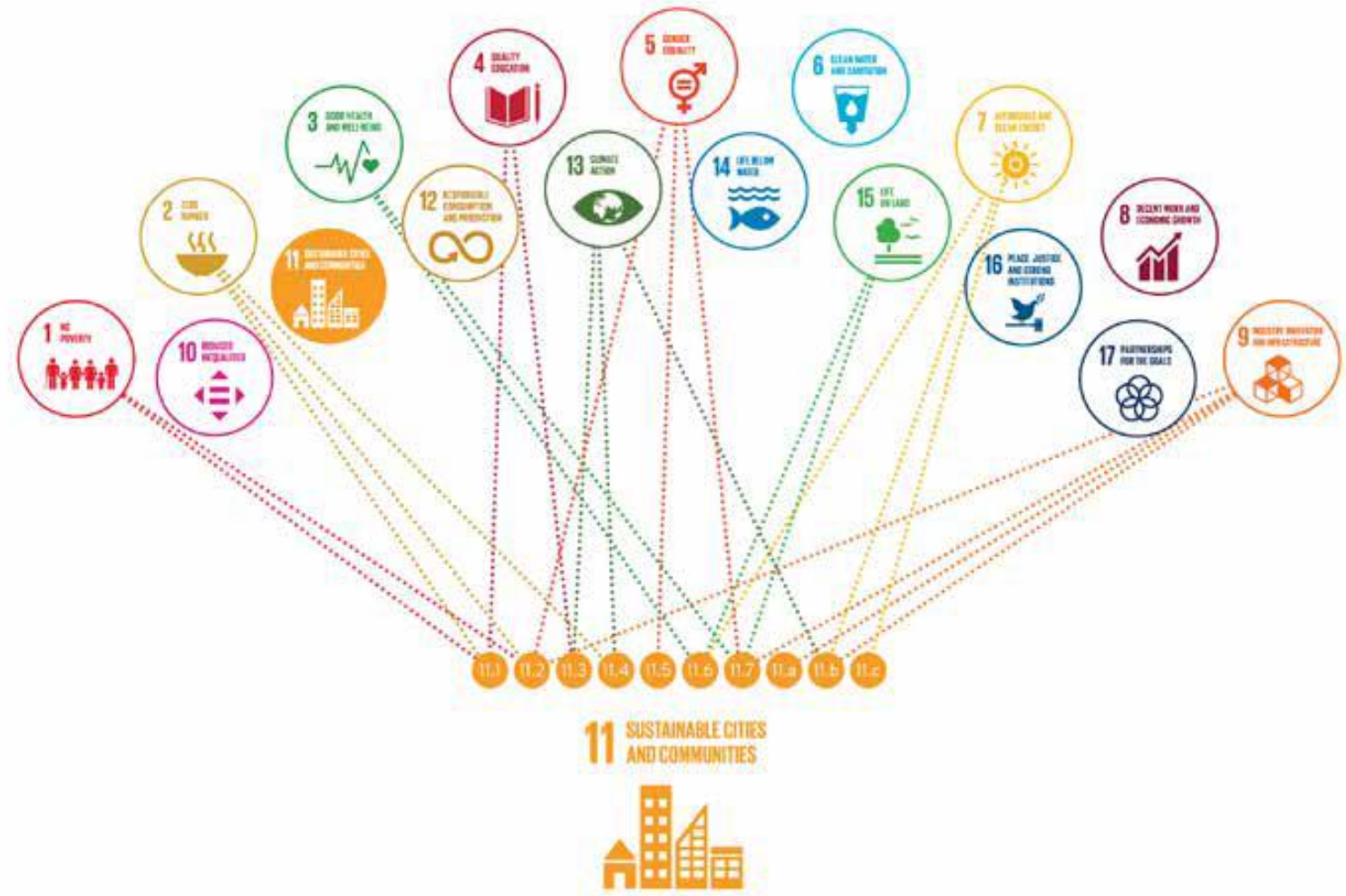


# SDG 11

## Relations with other SDGs

### Entry point character of SDG 11 with respect to the other 16 goals

- Most issues in the SDGs have an urban interpretation
- Complexity
- Interactions
- Tradeoffs



Jonas Bylund / JPI Urban Europe ‘Strategic Research and innovation Agenda 2.0’.

# SDG11: Targets



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**11.1** By 2030, ensure access for all to **adequate, safe and affordable housing** and basic services and upgrade slums

**11.2** By 2030, provide access to **safe, affordable, accessible and sustainable transport systems** for all, improving **road safety**, notably by **expanding public transport**, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

**11.3** By 2030, enhance inclusive and sustainable urbanization and capacity for **participatory, integrated and sustainable human settlement planning** and management in all countries

**11.4** Strengthen efforts to protect and **safeguard the world's cultural and natural heritage**

**11.5** By 2030, significantly **reduce the number of deaths and the number of people affected** and substantially decrease the direct economic losses relative to global gross domestic product caused by **disasters**, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations

**11.6** By 2030, **reduce the adverse per capita environmental impact of cities**, including by paying special attention to **air quality** and municipal and other **waste management**

**11.7** By 2030, provide universal access to **safe, inclusive and accessible, green and public spaces**, in particular for women and children, older persons and persons with disabilities

**11.A** Support **positive economic, social and environmental links between urban, peri-urban and rural areas** by strengthening national and regional development planning

**11.B** By 2020, substantially increase the number of cities and human settlements **adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change**, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels

**11.C** Support least developed countries, including through financial and technical assistance, in **building sustainable and resilient buildings utilizing local materials**

# What is a systems approach to urban infrastructure delivery?



Creating healthy, productive urban spaces that avoid sprawl, reduce carbon emissions and improve residents' well-being.

- Applies forward-looking spatial and land use planning.
- Integrates green buildings and streets, renewable energy and nature-based solutions.
- Simultaneously manage and evolve multiple infrastructure sectors.
- E.g. the 15-minute city model.



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# Case Study:

## Intensification and transport interventions to combat climate change in Melbourne



In Australian cities, the aim should be to maximise development along new and future road public transport corridors.

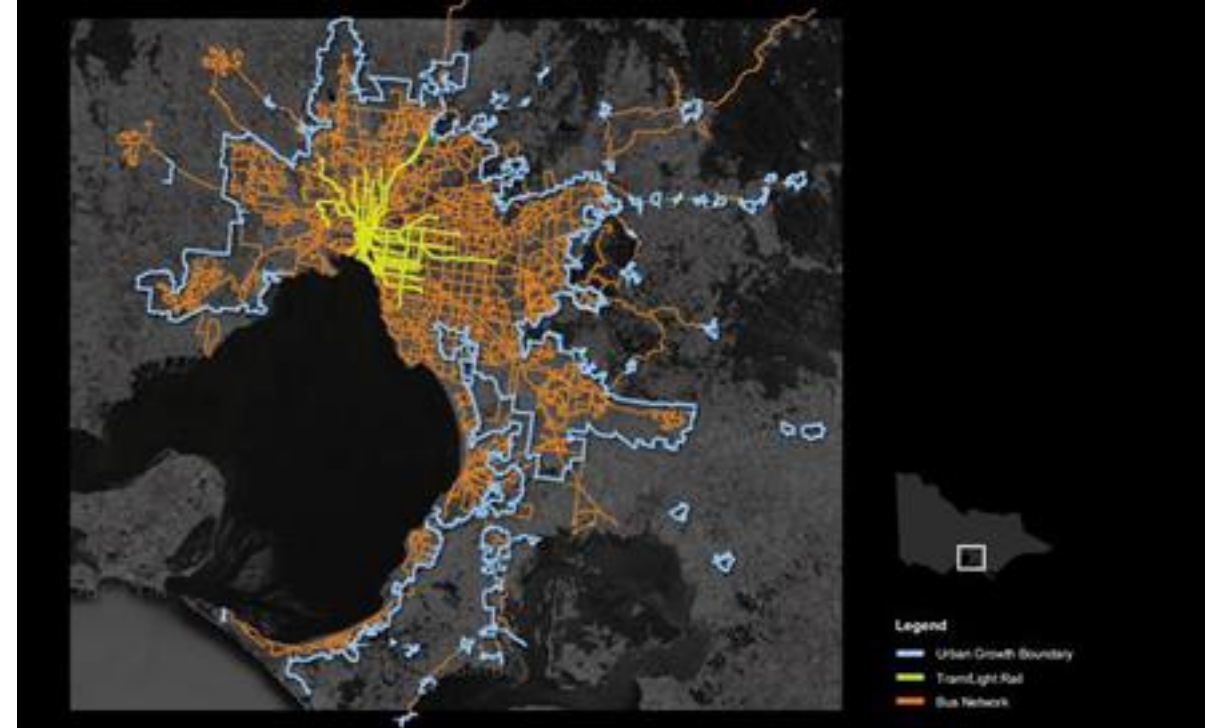
### Problem:

In 1985, Melbourne, like many other modern cities, had a central business district (CBD) that emptied out at night and over the weekend as the population moved to the low-density suburbs. This model was increasingly inefficient and unsustainable; major urban infrastructure reached peak capacity for only brief periods each day, commuting distances and times were increasing, and prime agricultural land was covered in concrete and asphalt. An alternative approach was needed to increase urban efficiency. The city took advantage of a property market crash in the late 1980s to begin to shift the paradigm.

# Two-pronged Approach



A possible future for Nicholson Street (looking south towards the city), shown as current utilisation.



Combining dedicated tram corridors with extended dedicated bus corridors could achieve a rapid expansion of Melbourne's public transport infrastructure.



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# Case Study:

## Intensification and transport interventions to combat climate change in Melbourne



Streets will be modified to favour rapid public transport, bicycles and pedestrians over motor vehicles.

### Impact:

- Eliminating loss of embodied energy
- Population increase from 685 (1982) to 41,000 (2016)
- Demonstrated doubling of population over 30 years without appropriation of farmland
- No impact on sensitive areas
- Savings in infrastructure costs
- Climate change adaptation, liveability and financial efficiency could be met by adopting a systems perspective
- Solutions addressing buildings and transport together yield better results than isolated approaches

# Integrated technological and engineering solutions



- Building retrofits
- Digital infrastructure
- Electrification
- Digital twins (evaluation of proposed solutions)

# Integrated nature-based solutions



- Managed ecosystems (climate change mitigation, biodiversity, environmental quality, economic and social wellbeing)
- Co-benefits (replacing grey infrastructure - not provided by technological solutions)
- E.g. green roofs; city parks; wetlands (wastewater treatment); permeable surfaces, vegetation, rain gardens (flooding mitigation); city lagoons (water run-off storage); urban agriculture
- Challenges: longer to implement, less visible, require cross-sectoral collaboration







# Why do we need a systems approach to urban infrastructure delivery?

It makes it easier to take cross-sectoral action and evaluate any impacts holistically, it also aids climate resilience and helps reduce carbon emissions

- Urban activities are supported by multiple infrastructural sectors.
- Cities can shape demand and use, but have limited influence on supply side.
- Need to address multiple impacts at local and supply-chain levels
- Climate resilience needs to address sprawl through densification and transit-oriented development while mitigating negative effects of density
  - ✓ Nature
  - ✓ Active mobility + efficient public transport
  - ✓ Green buildings and retrofits
  - ✓ Waste management systems
  - ✓ Social infrastructures

# How to implement systems approach to urban infrastructure delivery?

- Multi-infrastructure planning and cross-sectoral policies
- Enhancing multilevel governance
- Participatory, tailored strategies to promote local economic development and social cohesion
- Climate resilient value chain for urban development

	<b>Resilient</b>	<ul style="list-style-type: none"><li>– Shifts in the economy</li><li>– Adaptive infrastructure to climate change</li><li>– Smart solutions</li></ul>
	<b>Resource-efficient</b>	<ul style="list-style-type: none"><li>– Circular economy and zero waste</li><li>– Water and energy management</li><li>– Rural-urban linkage</li></ul>
	<b>Sustainable</b>	<ul style="list-style-type: none"><li>– Low-carbon development</li><li>– Green energy</li><li>– Green infrastructure</li></ul>
	<b>Socially inclusive</b>	<ul style="list-style-type: none"><li>– Socioeconomic trends</li><li>– Vulnerable groups</li><li>– Immigration/migration</li></ul>

Key principles of the Sustainable Urban Economic Development Programme

# How to implement systems approach to urban infrastructure delivery?



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- Comprehensive engagement among diverse stakeholders
- Involvement of those disproportionately affected by climate change
- Evidence-based strategies
- Support from private sector and civil society
- Building trust among stakeholders

Stakeholders	Role and value to infrastructure policies
Residents	Resident demands for high-quality infrastructure and services are the core of any infrastructure policy. Engaging residents also helps identify problems with current infrastructure.
Infrastructure operators	Infrastructure operators (e.g. utilities) provide services, often through public contracts, and need to drive investment to meet climate change challenges.
City governments	City governments regulate infrastructure planning and delivery and/or provide infrastructure and services, either directly or through community-owned utilities and companies. For private-sector delivery, the city is typically the counterparty to the concession or public-private partnership (PPP) arrangement.
Regional and national policy-makers	Regional and national policy-makers set regulations (including tariffs), and license infrastructure providers (e.g. the electricity grid, regional transportation networks). They can enhance coordination through effective leadership in addressing climate change mitigation and adaptation.
Private sector	The private sector includes infrastructure users and providers, so incorporating their input can help to identify problems and improvements. Additionally, the private sector can finance infrastructure development in markets where enabling policies encourage private investment and protect investors' rights.
Academia	Academia generates basic knowledge to improve the design and delivery of infrastructure and services. Innovative transdisciplinary research design can integrate academia with public-, private- or civic-sector actors, providing real-time evidence to guide implementation.
Non-governmental organizations	Non-governmental organizations can conduct effective outreach to communities, bringing in the perspectives of citizens to help shape decision-making.

Critical roles and values of stakeholders

# Case Study

## Bristol One City

### Problem:

In 2018, Bristol declared a climate and ecological emergency, setting the goal to become carbon neutral by 2030. It had already reduced corporate carbon emissions by 84% and overall city emissions by 39% between 2005 and 2018. To reach the carbon neutral goal, Bristol City Council called for a 'One City' collaboration to align partners' actions and resources.



# Case Study:

## Bristol One City



The Bristol One City Approach brings together a huge range of public, private, voluntary and third sector partners to work together to make Bristol fairer, healthier and more sustainable.

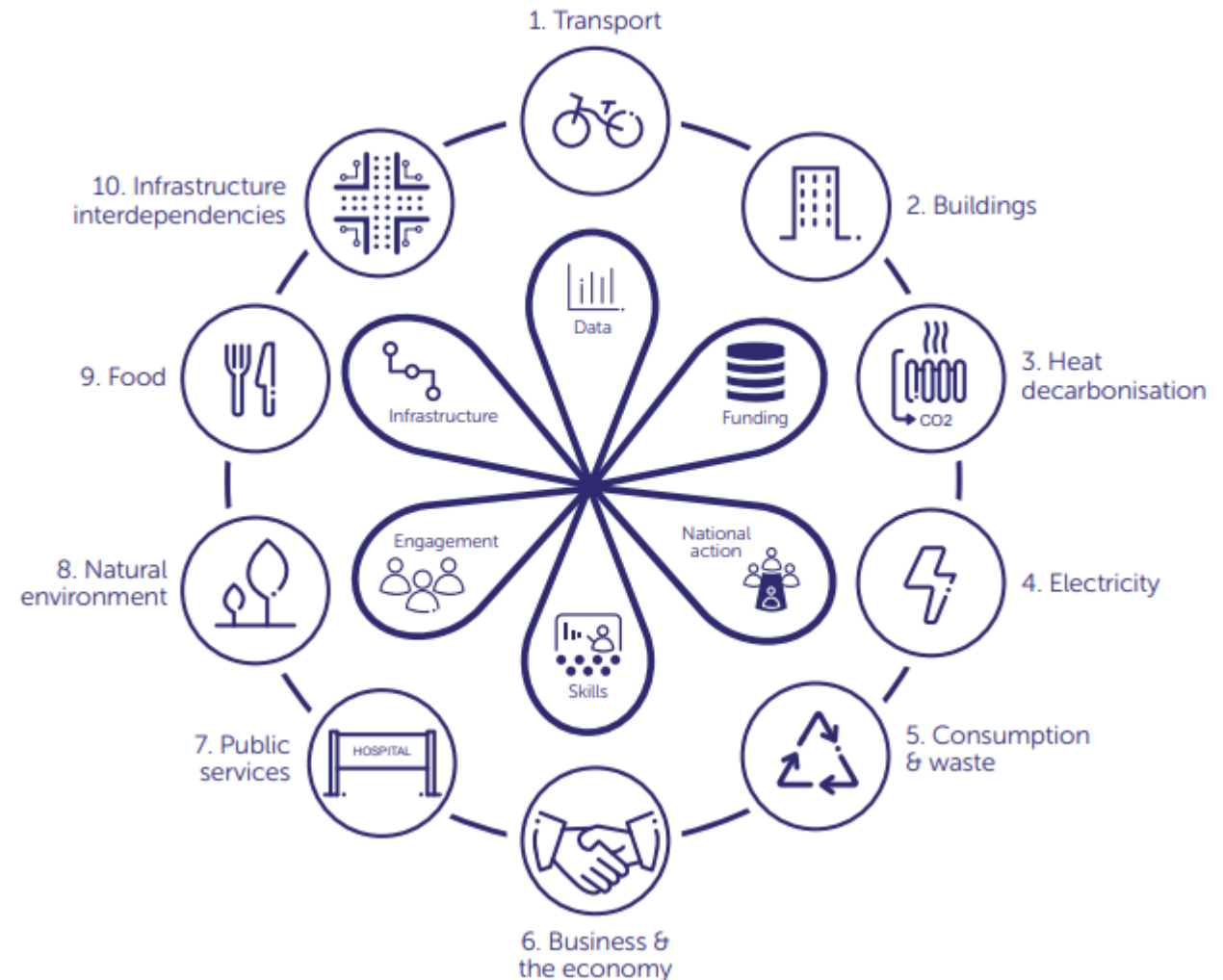
### The One City Plan:

- Economy and Skills
- Children and Young People
- Transport
- Home and Communities
- Environment
- Health and Wellbeing

# Case Study

## Bristol One City

- Climate + Ecological Strategy
- Food, Fuel Poverty, Children and Young People, Economic Renewal Strategies
- Citizens' Assembly on climate change
- Collective commitment and delivery structures
- The city council alone could not address the complexity

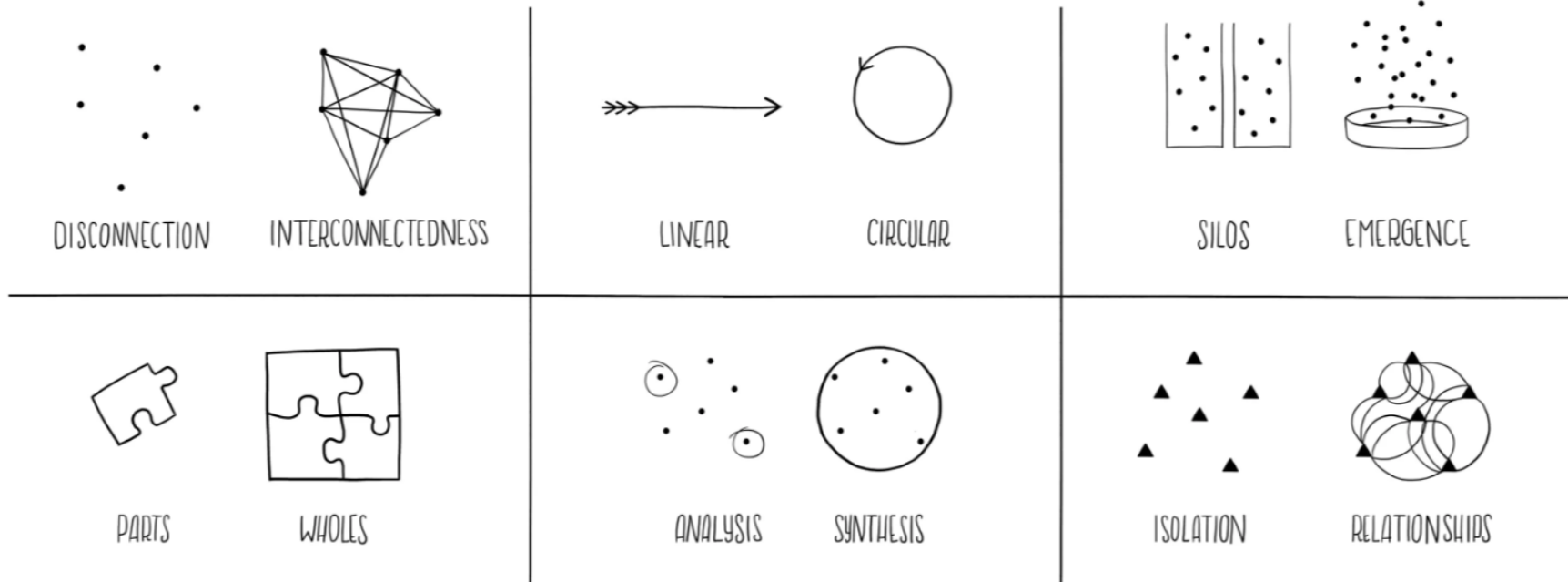


# Challenges of implementing a systems approach



1. Natural resource constraints and legacy infrastructure
2. Lack of technical and political capacity
3. Lack of multi-objective urban planning
4. Limited regulatory power
5. Weakness of multi-level governance systems
6. Weak collaboration among multiple social actors
7. Limited access to finance and resources
8. Lack of policy-relevant data and knowledge

# TOOLS OF A SYSTEM THINKER



You can follow Leyla at: <https://medium.com/@leyla-acaroglu>





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**thank you!**



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