Planning and complex systems

What systems thinking may give for planning?

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Cities and their complex realities

Planning with/in systems

How to ‘systems think’ in planning?

Why think about ‘how’ to plan?

“In an increasingly urbanised world, the future of cities will determine the well-being of future generations”

(European commission, The Future of Cities 2019)

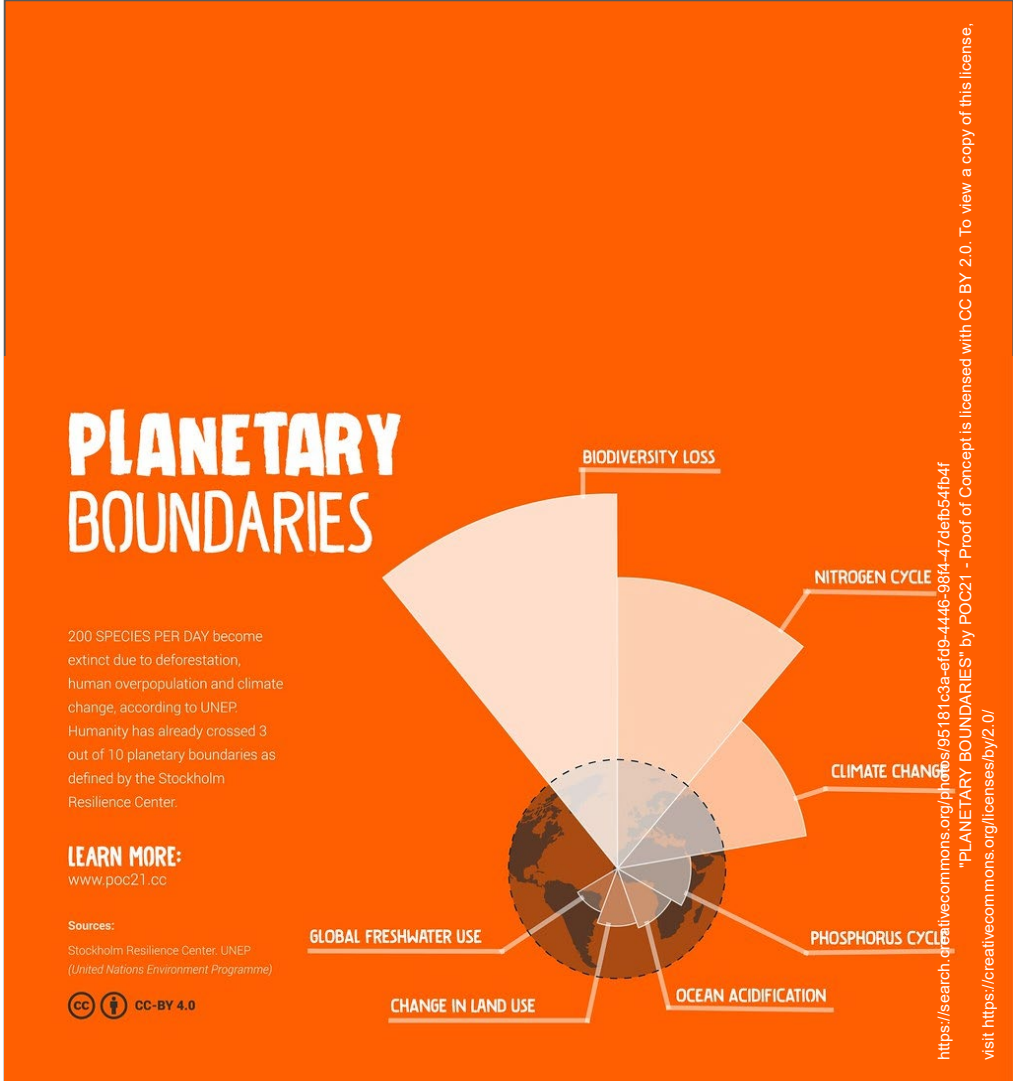
Complexity and sustainability

"Plans inform intentions. Plans do not make these intentions" (Hoch 2019, 2)

Smart

Sustainable

Resilient



Cities and their complex realities

Planning with/in systems

How to ‘systems think’ in planning?

Why think about complexity when planning?

Merriam-Webster

com·plex =

1. composed of two or more parts
2. hard to separate, analyze, or solve

Hard to define

Continuously changing

Cyclical and strongly interrelated

No binary or easily measurable answers available

Multi-level, multi-stakeholder, multi-value

Simple Puzzle

A Rubik's Cube is tough, but there is a single, agreed-upon solution

Complicated Problem

It's tricky to send a rabbit to the moon, but there is shared wisdom and rules to follow

Complex Mess

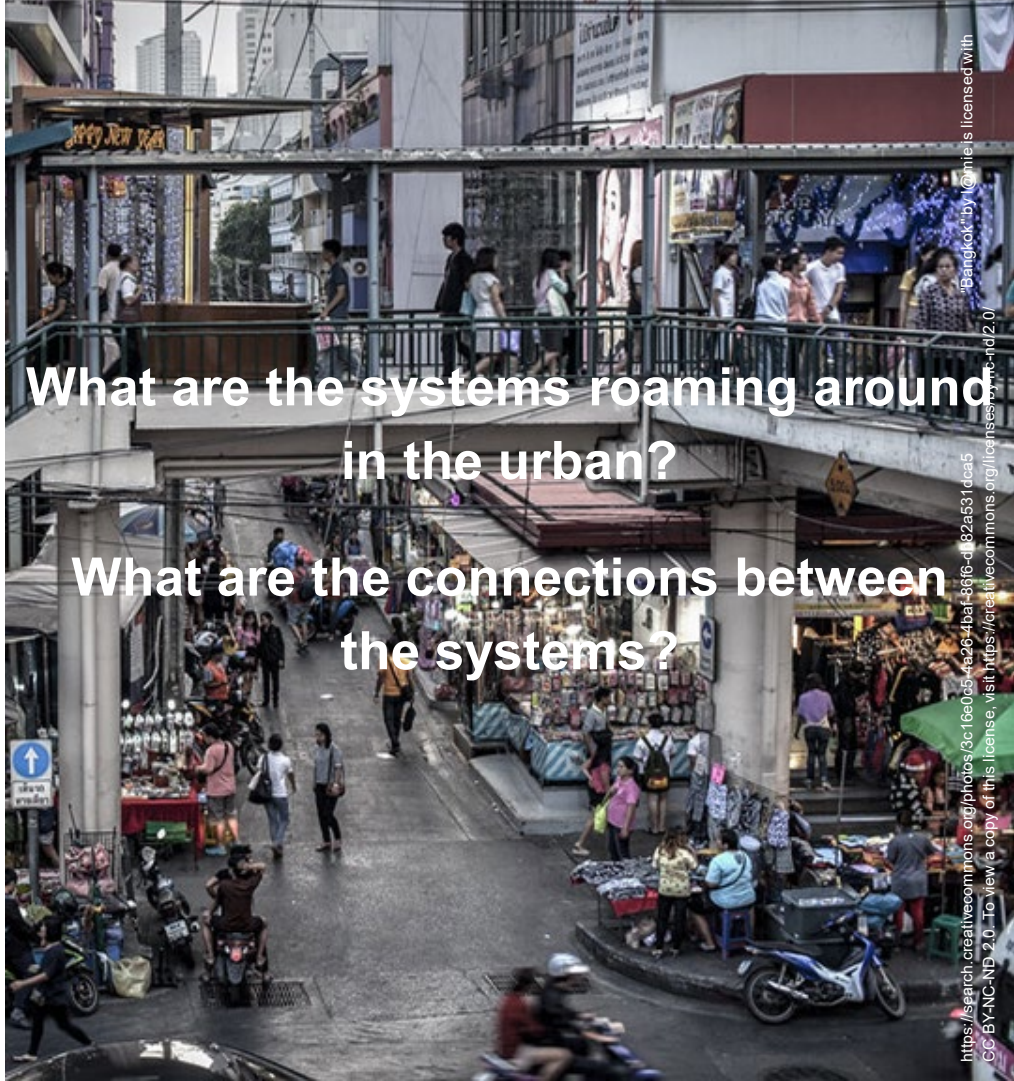
Raising a litter of bunnies is hard! Each bunny is different and they don't come with instructions

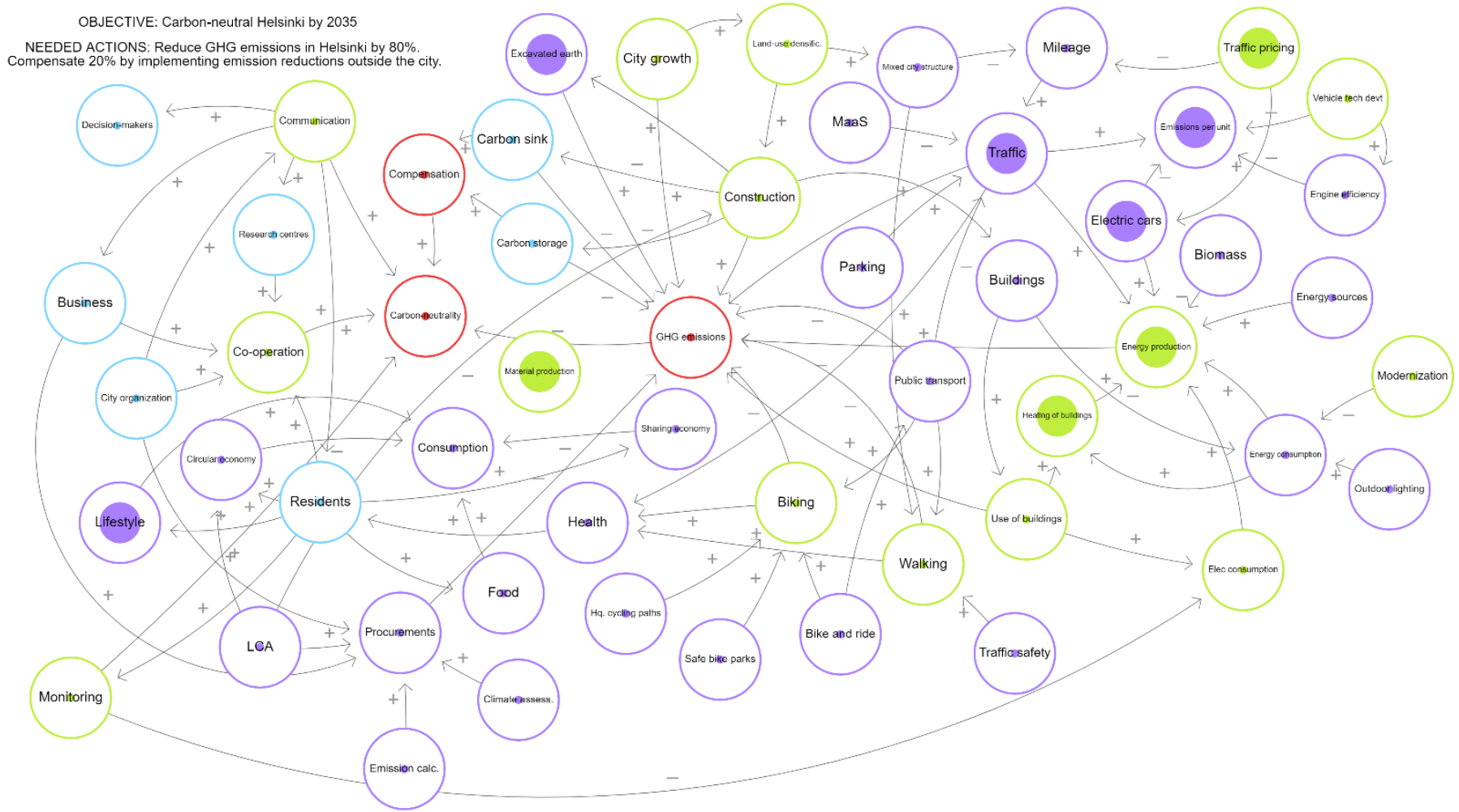
https://drive.google.com/file/d/0B0KwcwVlgAntYm00TzI4WnZTX0k/view

Embracing complex systems

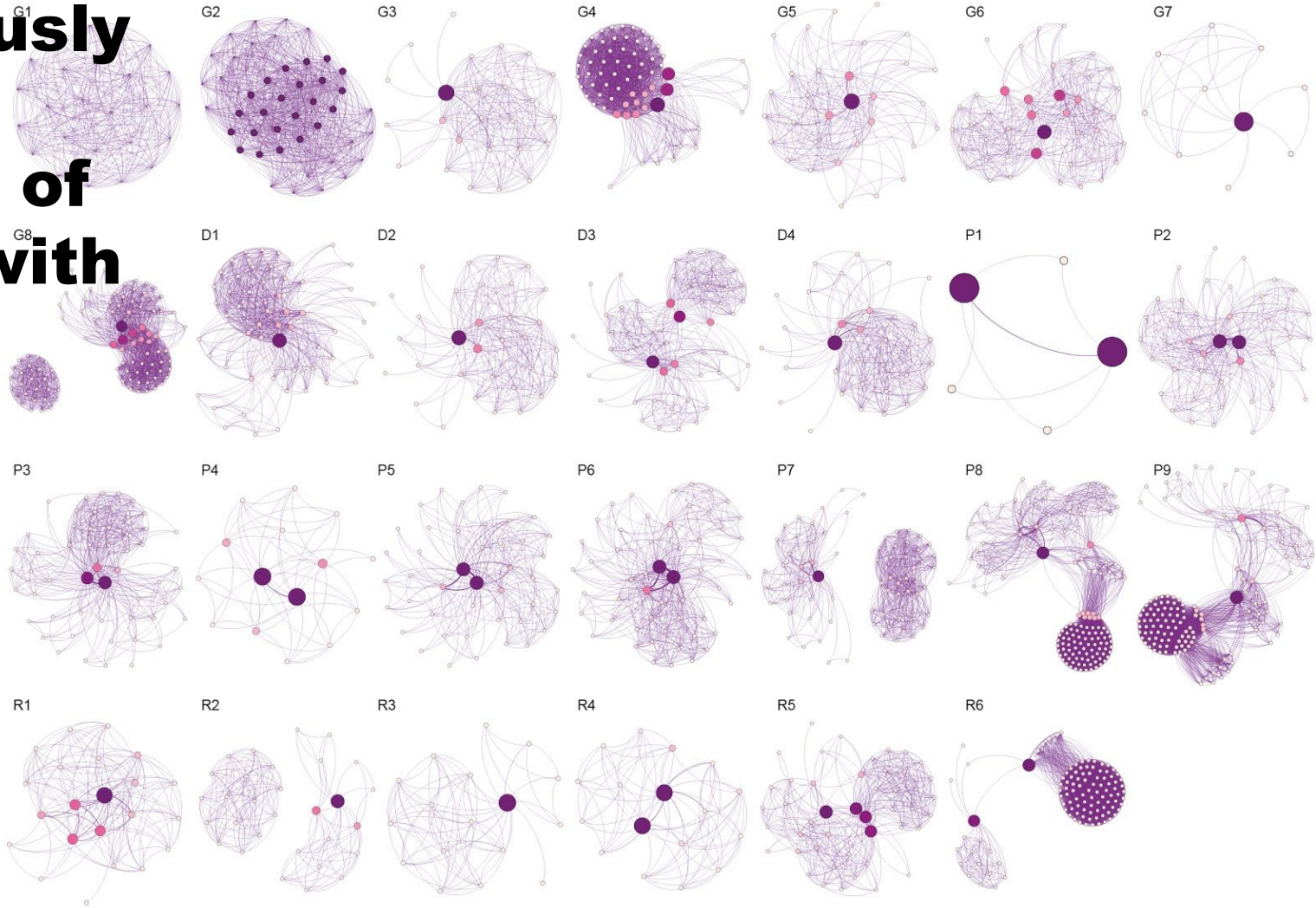
"We are complex systems - our own bodies are magnificent examples of integrated, interconnected, self-maintaining complexity"

(Meadows 2008, 3)



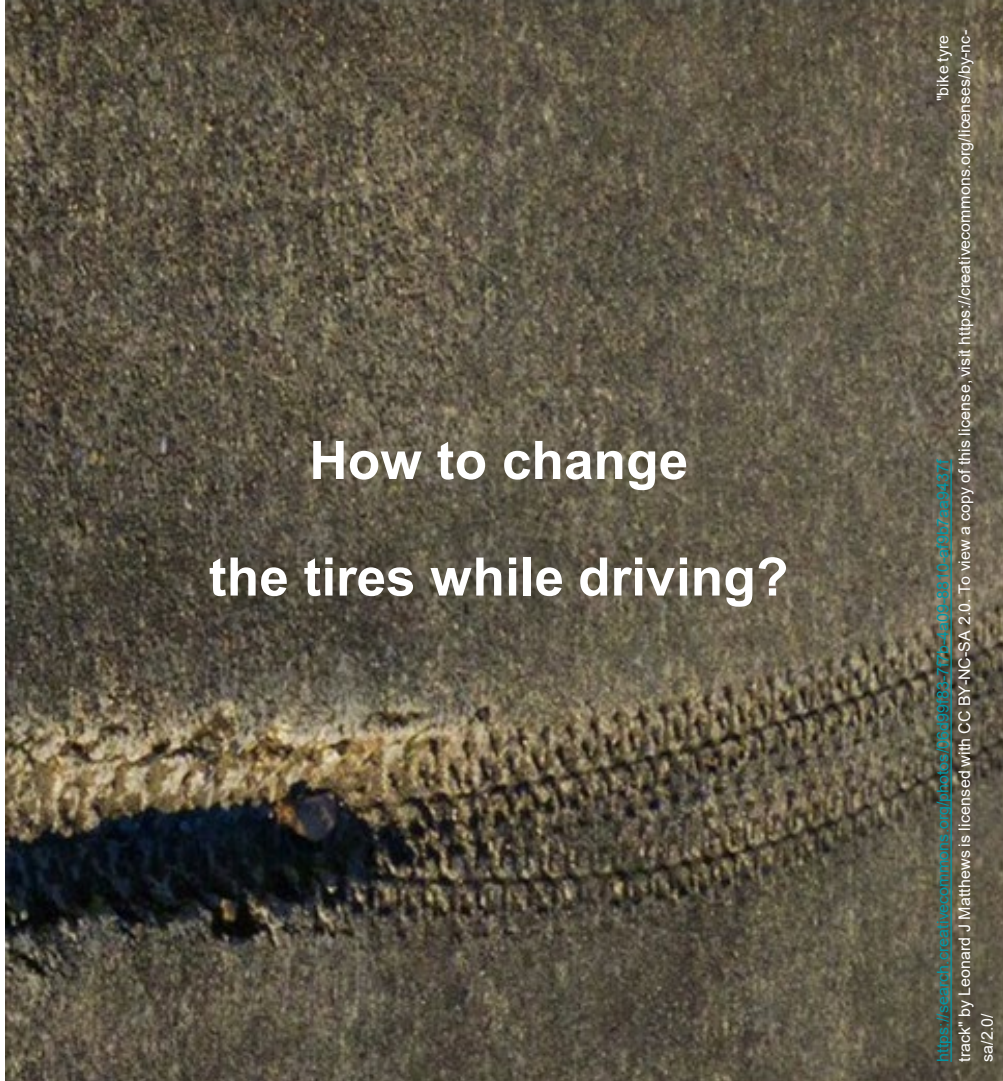

OBJECTIVE: Carbon-neutral Helsinki by 2035
NEEDED ACTIONS: Reduce GHG emissions in Helsinki by 80%.
Compensate 20% by implementing emission reductions outside the city.
Excavated earth
City growth
Land-use densific.
Mixed city structure
Mileage
Traffic pricing
Vehicle tech devt
Decision-makers
Communication
Carbon sink
MaaS
Traffic
Emissions per unit
Engine efficiency
Compensation
Construction
Electric cars
Research centres
Carbon storage
Parking
Buildings
Biomass
Business
Carbon-neutrality
GHG emissions
Energy sources
Co-operation
Material production
Energy production
Modernization
City organization
Public transport
Heating of buildings
Sharing economy
Circular economy
Consumption
Energy consumption
Outdoor lighting
Residents
Biking
Use of buildings
Lifestyle
Health
Walking
Food
Elec consumption
Hq. cycling paths
Bike and ride
Procurements
LCA
Safe bike parks
Traffic safety
Monitoring
Climate assess.
Emission calc.

Continuously changing networks of humans with differing views



Complex systems in planning - so what?

“The greatest complexities arise exactly at boundaries”
(Meadows 2008, 95)



Cities and their complex realities

Planning with/in systems

How to ‘systems think’ in planning?

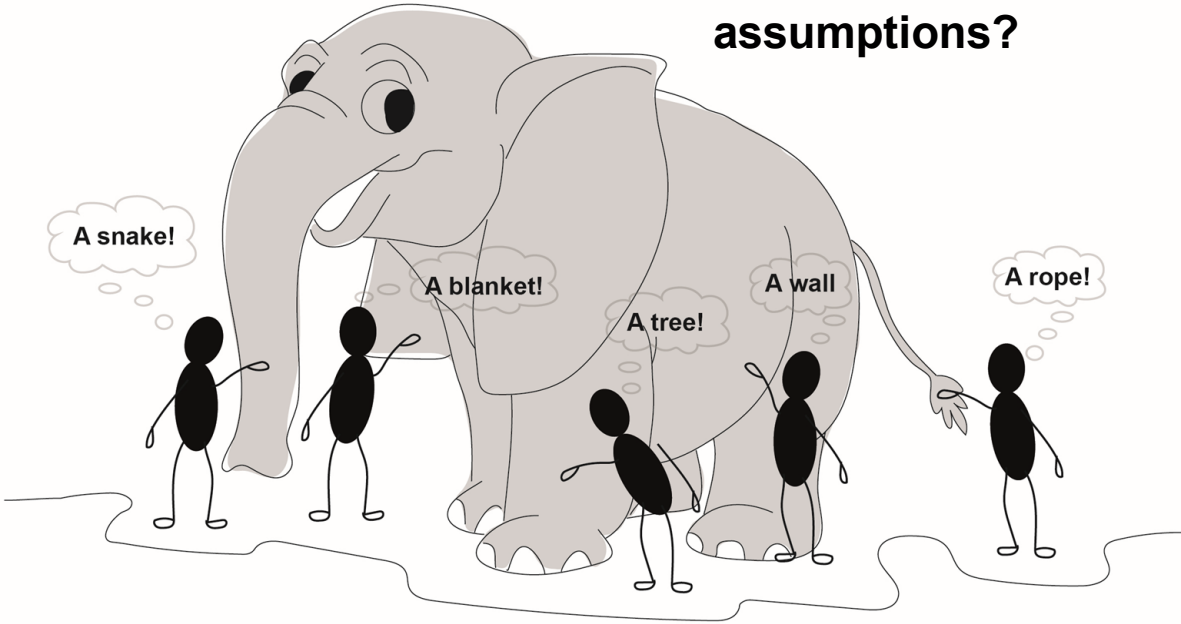
Ready to cross some boundaries?

What is the ‘whole’ we are trying to understand?

What views are needed to understand it?

How do my past experiences influence the development of my assumptions?

“Behavior of a system cannot be known just by knowing the elements of which the system is made” **(Meadows 2008, 7)**



Escaping the ‘complexity gap’?

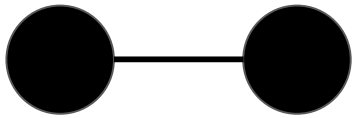
“You think that because you understand ‘one’ that you must therefore understand ‘two’ because one and one make two. But you forget that you must also understand ‘and’”

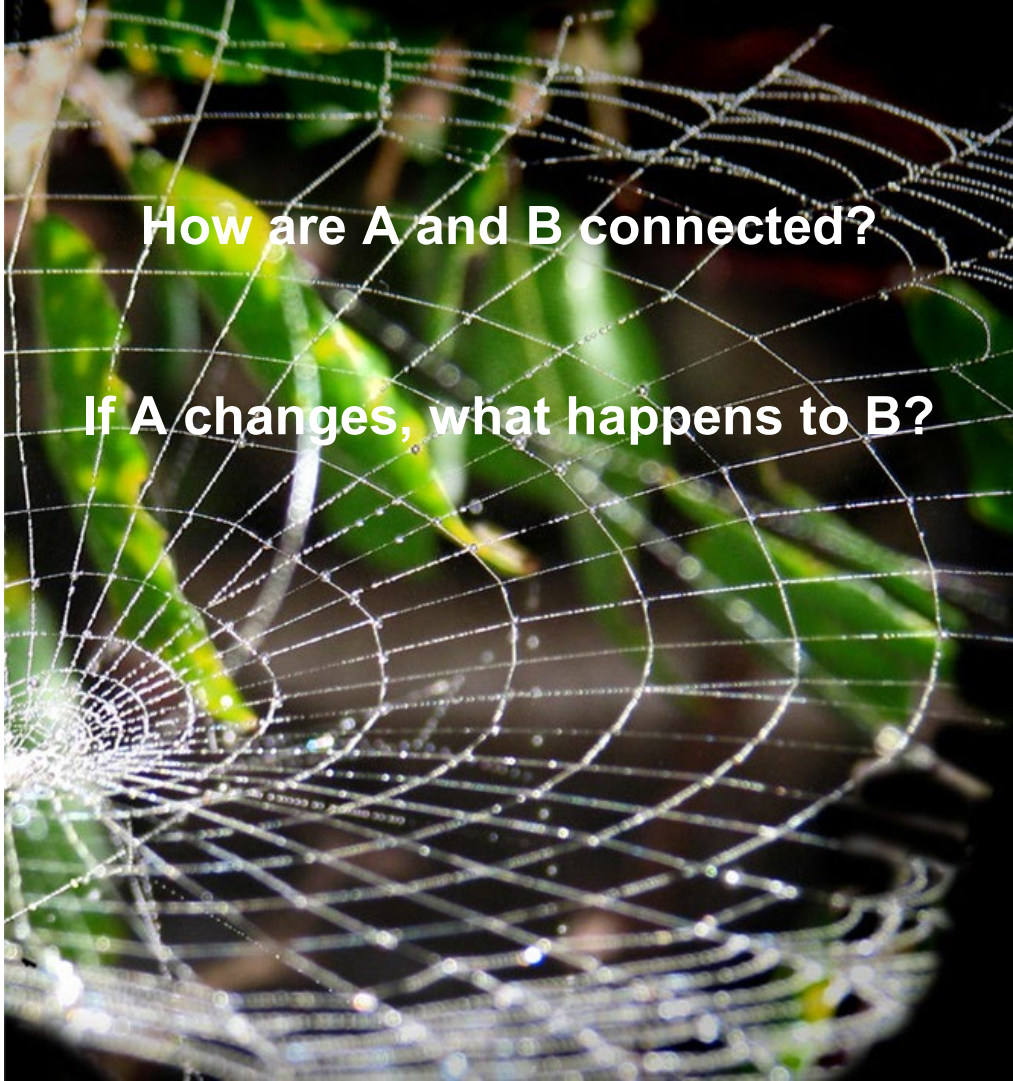
(Meadows 2008, 12)

Interconnections hold a system together

"A system is a set of things [...] interconnected in such a way that they produce their own pattern of behavior over time"

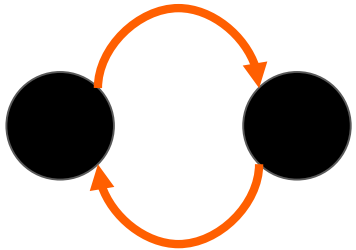
(Meadows 2008, 2)





Feedbacks keep the system changing

"Systems thinkers see the world as a collection of 'feedback processes'"
(Meadows 2008, 25)



What elements in the system change over time? How fast?

Is their change interrelated?

How does one change affect another?

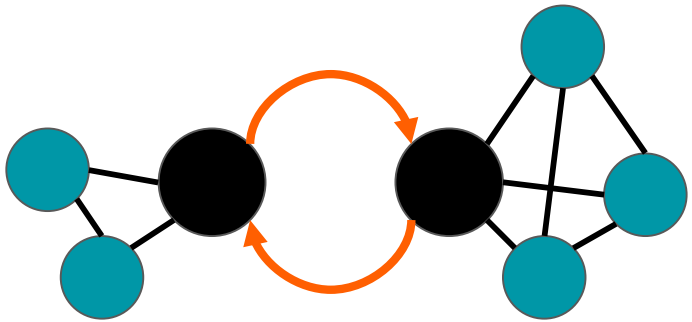
What if?

If A causes B, is it possible that B also causes A?

Boundaries frame our understanding

"Where to draw a boundary around a system depends on the purpose of the discussion - the questions we want to ask"

(Meadows 2008, 97)



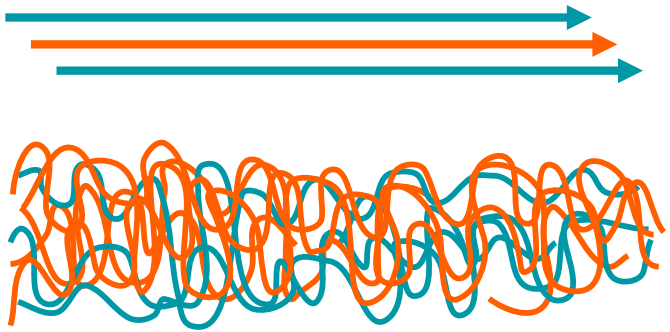
What are we trying to understand?

How does the chosen

boundary impact our understanding of the questions?

Living with change and uncertainty

“Only thing that remains constant is change”



How has the system changed over time?

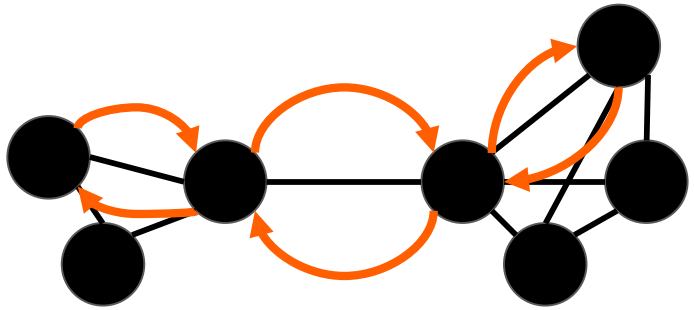
What has influenced change?

Is the plan strongly based on a specific scenario or assumption?

What are the risks involved?

Planning in the world of systems

1. *Identify parts*
2. *Identify relevant interrelations*
3. *Identify feedback loops*



Expose your assumptions

Cross boundaries

Co-create understandings

Consider time

Pay attention to what might be(come) important

Embrace complexity

Stay humble to learn

Thank you!

https://www.thinkingtoolsstudio.org/cards

https://ncase.me/loopy/

https://graphcommons.com/

Meadows, D. H. (2008). Thinking in systems: A primer. chelsea green publishing.

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